



## A STUDY ON DIAGNOSTIC ACCURACY OF ULTRASOUND AND FINE NEEDLE ASPIRATION CYTOLOGY IN SOLITARY THYROID NODULE AND REFLECTION OVER ITS MANAGEMENT IN A TERTIARY CARE HOSPITAL

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### ABSTRACT

**Introduction:** The clinically solitary thyroid nodule may be defined as "A thyroid swelling, which on clinical examination appears to be a single palpable nodule in an otherwise normal gland". Solitary thyroid nodule still remains a mystery for surgeons and pathologists in these days of recent advances.

**Aims and objectives:** To study the incidence rate of solitary thyroid nodule in different age group of population with respect to different pathology, investigations and management.

**Material and methods:** The present study consists of study of 100 cases of solitary thyroid nodule. Complete history was taken and full clinical examination was carried out.

**Results:** The sensitivity and specificity of FNAC were 74% and 100% respectively. The sensitivity and specificity of USG were 73% and 85.3% respectively, hence with the use of USG along with FNAC will improve the diagnostic accuracy to a higher level. Solitary nodule thyroid (SNT) more in females (M: F 1:2.33). Duration of swelling prior to the presentation was from 6 months to 3 yrs. The incidence of malignancy in our series in STN is 18%. On FNAC majority were benign with being more common. All the lesions suspicious on FNAC (31.3%) proved to be a malignant indicating need for surgery.

**Conclusion:** Majority of patients are euthyroid on presentation. FNAC is first investigation of choice. USG is a useful diagnostic aid. Modified neck dissection is advised for patients with enlarged nodes in papillary carcinoma and for those pos-op patients who are diagnosed to have malignancy with lymph node metastasis.

**KEYWORDS :** Solitary Thyroid Nodule, Pathology, Investigations, Management

### Introduction

The clinically solitary thyroid nodule may be defined as "A thyroid swelling, which on clinical examination appears to be a single palpable nodule in an otherwise normal gland" [1]. Solitary thyroid nodule still remains a mystery for surgeons and pathologists in these days of recent advances, because of the variations in pathological findings presented by it. Because of its highly malignant nature; it can be turn fatal as there are no clinical symptoms. On contrary large solitary thyroid nodule may be benign after pathological diagnosis. Thus it can't be judge through its clinical presentation.

The routine use of fine needle aspiration cytology (FNAC) in the assessment of thyroid nodules has reduced the number of patients subjected to thyroidectomy for benign diseases of the thyroid [1, 2, 3, 4]. As a result, the incidence of malignancy at thyroidectomy has increased from 5-10% to 30-50% in the recent years [5, 6]. This relatively simple procedure has assumed a dominant role in determining the management of patients with thyroid nodules [7, 8]. However, the success of FNAC is contingent upon several important contributing influences including aspirator experience [9, 10, 11], skilful cytological interpretation and a rational analysis based upon a synthesis of cytological and clinical

The objective of this prospective study was to evaluate the clinical, thyroid FNAC and USG, correlate it with histopathological examination. Due to advancement of imaging technology, most importantly USG; the management of thyroid pathology becomes easy nowadays.

### Materials and Methods

A prospective study carried out on 100 patients of solitary thyroid swelling between the age group of 11-70 yr, attending department

of surgery, IMS AND SUM HOSPITAL, BHUBANESWAR during the period of JUNE 2016 to JUNE 2017. Patients with pubertal thyroid swelling, multinodular and unwilling patients were excluded from all patients were examined clinically after taking detailed history; they were investigated with FNAC and USG of the thyroid. High resolution 7.3 MHz probe is used for USG [14]. FNAC was done using a 23-Gauge needle attached to a Franken's handle, either without or with aspiration by a 20 ml disposable syringe [15]. The types of FNAC results were interpreted as malignant, benign, suspicious, and inadequate aspirate. In cystic nodules, contents aspirated and looked for cytological analysis [12, 13, 16]. Through ultrasound, the nodules were evaluated for location, size, margins, echotexture, presence of halo calcification, vascularity, cervical nodes and consistency to differentiate malignant from benign lesion [14]. After all Investigations and evaluation, patients Subjected to surgery, the Histopathological examination of the specimen were correlated with finding of FNAC and USG [13, 17].

### Result:

The age of the patient's ranges from 11-70 yrs, the commonest age group with thyroid pathology is 31-40 yrs and mean age of 35.4yrs. Majority of patients were females (70%) (M: F- 1:2.33). All the patients were presented with swelling in front of neck and 28 patients with pain in the swelling. Duration of complaints ranged from 1 week to 8 yrs. Clinical diagnosis of solitary nodule of thyroid was commonest with benign category (colloid goiter) occupies the major group with 61 followed by 29 cases suspicious and malignant 10 cases. The most common lesion in HPE was benign follicular adenoma 33 and the least being benign cyst 02 (Table 1-8). On USG cases with benign category (colloid goiter) is major group 70 cases, followed by malignant 25 and suspicious 5. Out of the 100 patients diagnosed to have STN, HPE revealed 82 benign and 18 malignant. In 61

cytologically diagnosed benign cases, all proved to be benign, only malignant lesion found was papillary carcinoma 10 cases. All the 27 cases of follicular neoplasm were subjected to surgery and correlated with HPE, 10 cases were benign and 9 cases were malignant. The USG diagnosis of benign lesion was confirmed in 66 (93.5%) out of 70 cases and was disputed in 2 (6.05%) cases by histopathology which turned to be malignant. In 5 USG suspects, HPE revealed 3 benign and 2 malignant lesions. Among 25 USG diagnosis of malignant lesions, 13 were confirmed by HPE and 12 were disputed to be benign. The USG diagnosis of benign lesions was confirmed in 52 (74.25%) cases out of 70 and was suspicious in 18 cases by FNAC. Out of 5 suspect cases 2 turned to be malignant. Out of 25 malignant cases 9 were proved by FNAC and 10 were suspicious. Seventeen cases were revealed as multi nodular by USG out of 100 cases solitary thyroid nodule which clinically showed STN. The commonest surgery performed was hemithyroidectomy in 63 cases. Subtotal thyroidectomy done in 16, total thyroidectomy in 29 and Functional neck dissection was done in 13 (out of 29) patients of papillary carcinoma thyroid where lymph nodes palpable.

**Table 1: Shows age and gender distribution**

Age (years)	Male (30)	Female (70)	Total (100)
20	0	8	8
21-30	5	20	25
31-40	11	31	42
41- 50	9	6	14
51-60	4	4	8
61-70	1	1	2

**Table 2: Shows mode of presentation**

S. No.	Presenting Complaints	No. of Patients
1.	Swelling in front of lower neck	100
2.	Mild Pain in the swelling	15
3.	Difficulty in breathing	04
4.	Cervical lymph adenopathy	18
5.	History of Change in voice	01
6.	Loss of weight / hyperthyroidism	03
7.	Intolerance to cold / hypothyroidism	02

**Table 3- Comparison of USG and FNAC: BENIGN, Sensitivity – 85.20%, Specificity –60%.**

Positive predictive value – 74.28%. Negative predictive value – 70%

USG		+	-	TOTAL
	+	52	18	70
	-	9	21	30
TOTAL		61	39	100

**TABLE-4 Comparison of USG and FNAC: MALIGNANT, Sensitivity – 90%, Specificity –82%, Positive predictive value – 36%, Negative predictive value –98.60%**

USG		+	-	TOTAL
	+	9	16	25
	-	1	74	75
TOTAL		10	90	100

**TABLE-5 COMPARISON OF USG WITH HPE; BENIGN, Sensitivity – 84%, Specificity –77.7%, Positive predictive value – 94.28%, Negative predictive value – 46%**

USG		+	-	TOTAL
	+	66	4	70
	-	16	14	30
TOTAL		82	18	100

**TABLE-6 COMPARISON OF USG WITH HPE; MALIGNANT, Sensitivity – 73%, Specificity –85.30%, Positive predictive value – 52%, Negative predictive value – 93.3%**

USG		+	-	TOTAL
	+	13	12	25
	-	5	70	75
TOTAL		18	82	100

**TABLE-7 COMPARISON OF FNAC WITH HPE: BENIGN Sensitivity – 81.3%, Specificity –100%, Positive predictive value – 100%, Negative predictive value – 46%**

FNAC		+	-	TOTAL
	+	61	0	61
	-	21	18	39
TOTAL		82	18	100

**TABLE-8 COMPARISON OF FNAC WITH HPE: MALIGNANT; Sensitivity – 74%, Specificity –100%, Positive predictive value – 100%, Negative predictive value – 91%**

FNAC		+	-	TOTAL
	+	10	0	10
	-	8	82	90
TOTAL		18	82	100

**Discussion**

Recruited subjects average age was 35 years from the wide range of 11-70 years. The number of males in the present study was 30 and females were 70 with M: F ratio of 1:2.33. Commonest clinical presentation is the presence of swelling in front of neck and presented between 6 months to 3 years. Overall sensitivity for FNAC in our series was 81.3% (benign), 74% (malignant), while the specificity was 100% for both benign and malignant lesions. FNAC has certain limitations due to suspicious diagnosis. In the present series 29 of cases were found to be suspicious, of which 9 were malignant on final HPE, thus an overall malignant rate of 31.03% for the suspicious group was found. Because of this high incidence of malignancy in suspicious lesions, surgical removal of these nodules should be strongly considered in these cases. Several studies concurred with present study findings of 18% malignancy in STN [15, 16, 17].

Watter et al interpreted USG has added advantage of examining whole gland but limited by the fact that no features were pathognomic for malignancy, so that it is regarded as complimentary to FNAC in the management STN [15]. It has been a consistent observation that risk of thyroid cancer is more common with solitary nodules. Watter et al have shown that the prevalence of multinodularity in clinically STN is 20%-40%. In our series it was 17%. It has been observed that thyroid nodule to be detected by palpation; it must be 1 cm while on USG as small as 3mm can be detected [17].

**Conclusion**

In this study sensitivity and specificity of FNAC was 74 %, 100% and it helped in planning correct management. USG had 73% and 85.3%, sensitivity & specificity; hence USG along with FNAC will improve the diagnostic accuracy. However combination of FNAC and USG will yield optimum results and avoids mismanagement.

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