



# CLINICAL EVALUATION OF THYROID NODULE

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## ABSTRACT

Thyroid nodules pose a common clinical challenge, necessitating accurate characterization to differentiate between benign and malignant lesions. This study aims to comprehensively investigate the clinical evaluation of thyroid nodules, emphasizing the diagnostic process, challenges encountered, and the correlation between clinical findings and histopathological outcomes. A prospective study was conducted among 100 patients aged 15-60 years presenting with nodular thyroid swelling. Inclusion criteria encompassed patients with thyroid nodules, while non-nodular swellings and non-cooperative patients were excluded. Clinical examinations, fine-needle aspiration cytology (FNAC), and thyroid ultrasonography (USG) were performed to assess nodules. High-resolution 7.3 MHz ultrasonography aided in differentiating benign and malignant nodules based on size, location, and echotexture. Subsequently, patients underwent surgery, and histopathological specimens were obtained and correlated with FNAC and USG results for specificity and sensitivity analysis. The study population predominantly comprised females (65%) in the age range of 28-40 years. Clinical examinations revealed swelling in all patients, with additional complaints of pain, difficulty in breathing, and swallowing. FNAC identified 59 benign, 31 suspicious, and 10 malignant cases, aligning with histopathological findings. The most common histopathological diagnosis was benign follicular adenoma. Surgical interventions primarily involved hemithyroidectomy (66%), subtotal thyroidectomy (6%), total thyroidectomy (12%), and functional neck dissection (16%). This study contributes to the understanding of thyroid nodule clinical evaluation, emphasizing the significance of FNAC and USG in distinguishing between benign and malignant lesions. The correlation of clinical, cytological, and histopathological data refines diagnostic accuracy, offering clinicians valuable insights for personalized patient management. Improved risk stratification and decision support in the clinical evaluation of thyroid nodules are anticipated outcomes, enhancing patient outcomes in this commonly encountered clinical scenario.

**Keywords :-** Thyroid nodules, Clinical evaluation, Fine-needle aspiration cytology (FNAC), Ultrasonography.

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## INTRODUCTION

Thyroid nodules are a common clinical concern, frequently encountered in routine medical practice. The thyroid, a butterfly-shaped endocrine gland located in the neck, plays a pivotal role in regulating metabolism through hormone secretion. Nodular formations within the thyroid are prevalent and can range from benign to malignant, necessitating thorough evaluation and

management [1-3]. Despite the widespread occurrence of thyroid nodules, the challenge lies in distinguishing between benign and malignant lesions. The clinical evaluation of thyroid nodules involves a comprehensive approach, incorporating various diagnostic modalities and tools to achieve accurate characterization and subsequent decision-making [4-6].

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The need for a standardized and systematic clinical evaluation protocol arises from the potential implications associated with thyroid nodules. While the majorities are benign and asymptomatic, a subset can harbor malignancies, emphasizing the significance of prompt and accurate diagnosis [7-9]. Thyroid nodules can be identified through routine physical examinations or incidentally discovered during imaging studies. The advent of advanced diagnostic techniques, such as high-resolution ultrasonography and fine-needle aspiration cytology (FNAC), has revolutionized the diagnostic landscape for thyroid nodules. These tools not only aid in characterizing the nodules but also play a crucial role in guiding subsequent management decisions [10-12].

This original article delves into the clinical evaluation of thyroid nodules, aiming to contribute valuable insights into the diagnostic processes, challenges encountered, and the correlation between clinical findings and histopathological outcomes. By examining a cohort of patients presenting with thyroid nodules, this study endeavors to enhance the understanding of factors influencing the decision-making process in the clinical management of thyroid nodules [13-14].

Through a meticulous examination of clinical data, imaging results, and histopathological correlations, this research seeks to refine the existing diagnostic paradigms, potentially paving the way for more accurate and personalized approaches in the clinical evaluation of thyroid nodules [15-16]. The outcomes of this study are anticipated to provide clinicians with valuable tools for risk stratification and management decision support, ultimately improving patient outcomes in the context of thyroid nodule evaluation.

## MATERIALS AND METHODS

This is a prospective study conducted among 100 patients of nodular thyroid swelling. All the patients are at an age group of 15-60 years attending the department of general surgery at , Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry during the period of August 2019 to August 2020.

**Inclusion criteria:** Patients having thyroid nodule, patients at an age group of 15-60 years.

**Exclusion criteria:** Patients having thyroid swellings which are not nodular and patients who are not cooperating are excluded from our study group.

Consent was taken from all the patients and they were examined clinically for a detailed history. They are also investigated with FNAC and USG of thyroid. High resolution probe of 7.3 MHz is used and the results of FNAC were interpreted as benign, malignant, suspicious and inadequate aspirate. They differentiated as benign and malignant based on size, location, echotexture, margins. Then the patients were subjected to surgery and HPE specimen was obtained and correlated with FNAC and USG to find the specificity and sensitivity by statistical method [17-18].

## RESULTS

In our study group, the age of the patients ranges from 15-60 years. Most common age group is around 28-40 years and majority of the patients were females i.e 65 in number.

Almost all the 100 patients are having swelling in the anterior neck region of the thyroid. Other than that, 32 patients are having pain in the swelling, 12 with difficulty in breathing and 10 are having difficulty in swallowing. On clinical examination, it says that 10 patients are having thyroid swelling cervicallymphadenopathy and 2 patients are having change in voice.

59 cases are benign category whereas suspicious 31 cases and malignant are 10 cases. In our study, there is no inadequate or insufficient cytological smear.

In 59 cytological diagnosed benign cases, all proved to be benign, 10 cases of papillary carcinoma are malignant lesion. Follicular neoplasias are noted as 31 cases and all were subjected to surgery and correlated with histopathology.

In our study group, majority of the patients undergone Hemithyroidectomy i.e; 66, whereas 6 patients went to Subtotal thyroidectomy, 12 patients undergone Total thyroidectomy and 16 patients in our study group went for Functional neck dissection.

**Table 1: Age of our study group**

Age	Male(n=35)	Female (n=65)	Total
15-20 years	3	10	13
21-40 years	23	45	68
41-60 years	9	10	19

**Table 2: Presenting complaints**

Complaints of the patients	No. of patients
Swelling in front of neck	100
Pain in the swelling	32

Difficulty in breathing	12
Difficulty in swallowing	10
Change of voice	2

Table 3: Distribution of lesions on FNAC

	FNAC lesions	
	Category	No
Benign (n=59)	Nodular goiter	13
	Colloid nodule	26
	Benign cystic lesion	16
	Hyperplastic thyroid nodule	4
Suspicious (n=31)	Follicular neoplasia	31
Malignant (n=10)	Papillary carcinoma	10
Inadequate (nil)	Nil	Nil

Table 4: In our study group, the most common lesion is benign follicular adenoma whereas MNG occupies the least

Histopathological diagnosis	n=100
Colloid nodule	28
Nodular goiter	9
Benign cystic lesion	4
Hyperplastic thyroid nodule	5
Benign follicular adenoma	34
MNG	3
Papillary carcinoma	17

Table 5: Correlation of FNAC lesions with Histopathology

Category	FNAC lesions	Histopathological Diagnosis	
Benign (n=59)	Nodular goiter (n=11)	Nodular goiter	1
		Benign follicular Adenoma	5
		MNG	4
		Papillary Carcinoma	1
	Benign cystic lesion(n=18)	Colloid nodule	3
		Nodular goiter	5
		Benign cystic Lesion	2
		Benign follicular Adenoma	6
		MNG	2
	Colloid nodule (n=23)	Colloid nodule	12
		Benign follicular Adenoma	8
		MNG	3
	Hyperplastic thyroid nodule (n=7)	Benign follicular Adenoma	7
Malignant (n=10)	Papillary carcinoma (n=10)	Papillary Carcinoma	10
Suspicious (n=31)	Follicular neoplasia (n=31)	Benign follicular Adenoma	12
		Colloid nodule	4
		Hyperplastic thyroid nodule	7
		Papillary Carcinoma	8

Table: 6 Type of surgery underwent in our study group.

Type of surgery	n = 100
Hemithyroidectomy	66
Subtotal thyroidectomy	6
Total thyroidectomy	12
Functional neck dissection	16

## DISCUSSION:

The demographic profile of our study group, encompassing individuals aged 15-60 years, revealed a predominant age distribution in the 28-40 years range. Females constituted the majority, with 65 cases, compared to 35 males. Sex distribution was similar when compared to Afroz et al. This demographic pattern aligns with the established understanding that thyroid disorders, particularly nodular or neoplastic conditions, disproportionately affect women, and the peak incidence often occurs in the third and fourth decades of life [19-20].

The primary clinical manifestation in all 100 patients was a swelling in the anterior neck region, consistent with thyroid involvement. Pain in the swelling was reported by 32 patients, while 12 experienced difficulty in breathing, and 10 had difficulty in swallowing. Two patients presented with a change in voice. These presenting complaints are indicative of the diverse symptomatic spectrum associated with thyroid disorders, ranging from asymptomatic nodules to those causing compression symptoms [21-23]. The FNAC results demonstrated a distribution of 59 cases in the benign category, 31 suspicious cases, and 10 malignant cases. Notably, there were no inadequate or insufficient cytological smears. The most common FNAC lesions in the benign category included nodular goiter, colloid nodule, benign cystic lesion, and hyperplastic thyroid nodule [24-25]. Suspicious lesions primarily constituted follicular neoplasia, while papillary carcinoma dominated the malignant category. Renshaw et al found that patients with at least two non diagnostic FNAC had significantly lower risk of malignancy (0%) compared to those who had only one non diagnostic FNAC (20%). On the other hand, Jo et al found that there is no relation between the malignancy rate and the number of nondiagnostic aspirations.

Histopathological analysis following surgical intervention confirmed the FNAC findings, with a high correlation between the two. Notably, all cytologically diagnosed benign cases were histopathologically confirmed as benign. Follicular neoplasia cases diagnosed by FNAC underwent surgery and were subsequently correlated with histopathology. Chow et al reported no significant correlation between pre-operative findings and risk of malignancy including the number of nodules and ultrasound characteristics as well as physical findings [26-28]. In the histopathological examination, the most common lesion was benign follicular adenoma (34 cases). This was similar to studies

done by Nzegwu et al and Edino et al, followed by papillary carcinoma (17 cases). This was similar to studies done by Nzegwu et al (56.5%) and Seleye-Fubara et al (54.5%). Colloid nodule, nodular goiter, benign cystic lesion, hyperplastic thyroid nodule, and multinodular goiter (MNG) also featured in the histopathological spectrum [29-30].

Detailed correlation revealed a concordance between FNAC and histopathology. For instance, in the benign category, nodular goiter and benign follicular adenoma were accurately identified by both FNAC and histopathology. Similarly, malignant lesions, specifically papillary carcinoma, were consistent between the two diagnostic modalities. The correlation underscores the reliability and diagnostic accuracy of FNAC in preoperative evaluation [31-33].

The surgical interventions in our study group primarily involved hemithyroidectomy, with 66 cases, followed by subtotal thyroidectomy (6 cases), total thyroidectomy (12 cases), and functional neck dissection (16 cases). The predominance of hemithyroidectomy aligns with the common surgical approach for benign lesions confined to one lobe, emphasizing the preservation of thyroid function whenever possible [34-35].

## CONCLUSION

This study underscores the clinical, cytological, and histopathological aspects of thyroid disorders. FNAC emerges as a valuable diagnostic tool, demonstrating a high correlation with subsequent histopathological findings. The predominance of benign lesions, particularly follicular adenomas, indicates the prevalence of non-malignant thyroid conditions in the studied population. The surgical interventions predominantly involve hemithyroidectomy, reflecting a tailored approach to the specific pathology identified.

While this study provides valuable insights, it is essential to acknowledge certain limitations, including the single-center nature of the study and the need for a larger, multi-center cohort for broader generalizability. Additionally, long-term follow-up data could enhance our understanding of postoperative outcomes and recurrence rates, contributing to improved clinical management strategies for thyroid disorders.

## Foot note:

**Conflict of interest:** None

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