

A CLINICAL AND HISTOPATHOLOGICAL ANALYSIS OF BENIGN THYROID MASS LESIONS

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Abstract

Background: Thyroid disorders with a particular focus on benign mass lesions are a prominent concern in the realm of clinical practice exerting a substantial impact on the health and well-being of affected individuals. The research aimed to assess patient demographics clinical presentation diagnostic findings and histopathological outcomes. **Material & Methods:** This study conducted over 24 months at a government tertiary care ENT hospital in Visakhapatnam examined 100 patients with cytologically confirmed benign thyroid mass lesions. The majority of patients were in the 31-40 years age group (29%) and 21-30 years age group (28%). Females constituted 92% of the study population. Notably, 98% of cases were new, with 67% displaying slow progression in swelling size. Most patients (62%) had no associated symptoms, while 44% presented with solitary nodules clinically. At diagnosis, 56% were euthyroid, 35% hypothyroid, and 9% hyperthyroid. Palpable sizes were predominantly 2-4 cm (55%) and 5-7 cm (35%). **Results:** Colloid nodular goiter (39%) and Hashimoto's thyroiditis (17%) were the most common non-neoplastic FNAC diagnoses. Neoplastic cases (12%) included follicular lesions of undetermined significance, follicular neoplasm, and Hurthle cell neoplasm. The majority of FNAC cases fell into Bethesda Category II (86%). USG findings showed multinodular goiter (50%), solitary thyroid nodules (22%), and thyroiditis (19%), with TR2 (not suspicious) being the most common TIRADS category (61%). Discrepancy existed between clinical and USG examination regarding nodularity, with 33% of patients undergoing surgery, including right hemithyroidectomy (18%) and left hemithyroidectomy (15%). Histopathological outcomes among surgically managed cases included benign non-neoplastic findings (48.48%), benign neoplastic findings (21.21%), and malignant cases (9.09%).

Conclusion: This study highlights the predominance of females and slow progression of benign thyroid masses in the study population. FNAC and USG provided valuable diagnostic information, with most cases categorized as Bethesda II and TR2. Surgical intervention was common, revealing diverse histopathological outcomes, emphasizing the need for individualized patient management.

INTRODUCTION

Thyroid disorders with a particular focus on benign mass lesions are a prominent concern in the realm of clinical practice exerting a substantial impact on the health and well-being of affected individuals.^[1] Within this domain, a wide spectrum of pathological

entities exists, each demanding precise diagnostic approaches and tailored management strategies. An in-depth understanding of the clinical presentation, diagnostic findings, and histopathological characteristics of benign thyroid mass lesions is pivotal for ensuring accurate diagnoses and formulating appropriate patient care plans.^[2,3]

Rationale for the Study

This study embarks on a journey to unravel the intricate details surrounding benign thyroid mass lesions. Over the course of 24 meticulously examined months, we embarked on a comprehensive analysis of 100 patients who had been diagnosed with benign thyroid mass lesions through cytological assessments.^[4,5] This study unfolded within the confines of a government tertiary care Ear, Nose, and Throat (ENT) hospital located in Visakhapatnam, providing us with a unique opportunity to delve deeply into these conditions. Our central aim was to meticulously dissect the clinical profiles of these patients, traversing through various aspects such as patient demographics, age distribution, gender disparities, clinical symptomatology, duration of symptoms, and the thyroid status of these individuals.

Significance of the Study

This exploration becomes increasingly imperative when one considers the multifaceted nature of benign thyroid masses. While some individuals may remain asymptomatic, others experience a range of symptoms that can profoundly influence their healthcare journey. Furthermore, the demographics and clinical presentation of these lesions exhibit substantial diversity, necessitating a customized approach in terms of diagnostic and therapeutic decision-making to cater to the unique needs of each patient.

Aim and Objectives

The primary aim of this study is to conduct an exhaustive clinical and histopathological investigation of benign mass lesions of the thyroid. Through this investigation, our objective is to provide valuable insights into the characterization and management of these prevalent thyroid conditions.

To evaluate the clinical profiles of patients presenting with benign thyroid mass lesions: This objective entails a meticulous assessment of patient demographics, age distribution, gender prevalence, clinical symptoms, duration of symptoms, and thyroid status. Our aim is to provide a comprehensive understanding of the clinical presentation of benign thyroid masses.

To assess the relative occurrence of various benign thyroid conditions manifesting as thyroid swellings, utilizing clinicopathological and radiological examinations: This objective involves a detailed examination of diagnostic findings, encompassing Fine Needle Aspiration Cytology (FNAC) diagnoses, Bethesda classifications, ultrasound (USG) findings, and Thyroid Imaging Reporting and Data System (TIRADS) classifications. By elucidating the relative occurrence of different benign thyroid conditions, we aim to enhance the diagnostic accuracy of these conditions and facilitate tailored patient management strategies.

MATERIALS AND METHODS

Study Design

This research follows a hospital-based cross-sectional study design. Cross-sectional studies collect data from a specific population at a single point in time or over a relatively short period. In this case, data collection occurred over two years, from November 2019 to October 2021.

Place of Study

The study was conducted at the Government ENT Hospital in Visakhapatnam. This indicates the specific location where the data collection and analysis took place.

Study Population

The target population for this study consisted of 100 patients who presented with benign thyroid masses during the specified study period at the Government ENT Hospital in Visakhapatnam.

Inclusion Criteria

Patients meeting the following criteria were included in the study:

Patients attending the ENT OPD (Ear, Nose, and Throat Outpatient Department) with neck swellings.^[6] Cases where Fine Needle Aspiration Cytology (FNAC) indicated Bethesda categories 1, 2, 3, and 4 for thyroid masses. Patients who provided their consent to participate in the study.

Exclusion Criteria

Patients meeting the following criteria were excluded from the study:

^[7] Cases where FNAC indicated Bethesda categories 5 and 6 for thyroid masses.

Patients with neck swellings not related to the thyroid.

Patients who did not provide informed consent.

Critically ill patients with comorbidities.

Ethical Consideration

The study adhered to ethical standards and obtained necessary approvals: Approval from the Institutional Ethics Committee at AMC (Andhra Medical College), Visakhapatnam. Written informed consent was obtained from each participant, indicating that they voluntarily agreed to participate in the study.

Data Collection and Analysis

Detailed patient history was collected, focusing on symptoms related to thyroid conditions. General physical, systemic, and local examinations were conducted on the patients. Hematological, biochemical, and thyroid function tests were performed, likely to assess the overall health and thyroid function of the patients. Ultrasound (USG) neck examinations were carried out, and the Thyroid Imaging Reporting and Data System (TIRADS) classification may have been used to evaluate thyroid nodules. USG-guided FNAC was performed on the thyroid masses, and the results were graded according to the Bethesda system.

For data analysis, statistical software such as Microsoft Excel and SPSS version 23 were used.

RESULTS

Patient Demographics and Clinical Presentation

Over a period of 24 months, 100 patients with cytologically confirmed benign thyroid mass lesions were studied at a government tertiary care ENT hospital in Visakhapatnam. These patients were selected based on specific inclusion and exclusion criteria as detailed in the methodology. Among these patients, some underwent surgical management, while others were managed conservatively.

Age Distribution

Predominantly, patients fell into the 31-40 years age group (29%) and 21-30 years age group (28%).

Age range covered ≤ 10 years to 61-70 years, with the least number of patients being above 70.

Gender Distribution

A significant female preponderance was noted with females constituting 92% and males 8% of the study population.

Clinical and Radiological Findings

Recurrence After Surgery:

98% of cases were new, while 2% represented recurrence after surgery.

Progression of Size of Swelling:

67% of the thyroid masses were slowly progressive, 31% non-progressive, and 2% showed a sudden increase in size.

Frequency of Associated Symptoms:

62% of patients had no associated symptoms.

Among symptomatic patients, common symptoms included weight gain (11%), menstrual irregularities (6%), and dysphagia (6%).

Laterality and Nodularity of Thyroid Masses:

The masses were distributed as 34% right, 32% left, 30% diffuse, and 4% in the isthmus.

Clinically, 44% of cases had solitary nodules, 43% multiple nodules, and 13% diffuse thyromegaly.

Duration of Symptoms

The majority of patients (54%) had symptoms for less than 1 year.

Thyroid Status:

At presentation, 56% were euthyroid, 35% hypothyroid, and 9% hyperthyroid.

Size of Swelling:

Most common sizes on palpation were 2-4 cm (55%) and 5-7 cm (35%).

Diagnostic Findings

FNAC Diagnosis

Non-neoplastic cases (88%) included colloid nodular goiter (39%), Hashimoto's thyroiditis (17%), and others.

Neoplastic cases (12%) comprised follicular lesions of undetermined significance, follicular neoplasm, and Hurthle cell neoplasm.

Bethesda Classification

The majority of FNAC cases fell into Bethesda Category II (86%), followed by Category IV (8%) and Category III (6%).

USG Diagnosis

Findings included multinodular goiter (MNG) with or without cystic changes (50%), solitary thyroid nodules (22%), and thyroiditis (19%).

TIRADS Classification

TR2 (not suspicious) was the most common category (61%), followed by TR3 (mildly suspicious) at 21%.

Comparison of Nodularity and Surgical Intervention

Nodularity on Clinical vs. USG Examination:

Discrepancy noted between clinical examination and USG findings, with a higher percentage of multiple nodules detected on USG (64%) compared to clinical examination (43%).

Surgical Intervention

A total of 33% underwent surgery: 18% right hemithyroidectomy (R. HT), 15% left hemithyroidectomy (L. HT), and 67% received no surgery.

Histopathological Outcomes

Histopathology of Surgically Managed Cases:

Among the 33 surgically managed cases, non-neoplastic findings included colloid nodules (12.12%), MNG with cystic changes (33.33%), and Hashimoto's (3.03%).

Benign neoplastic findings were follicular adenoma (18.18%) and Hurthle adenoma (3.03%). Malignant cases comprised follicular carcinoma (9.09%).

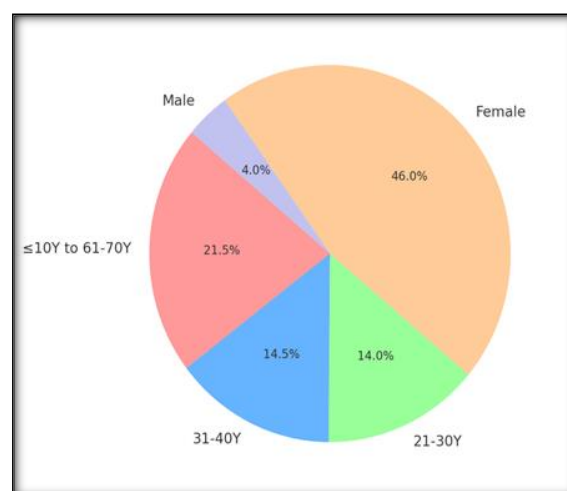


Figure 1: Patient Demographics: Age and Gender Distribution

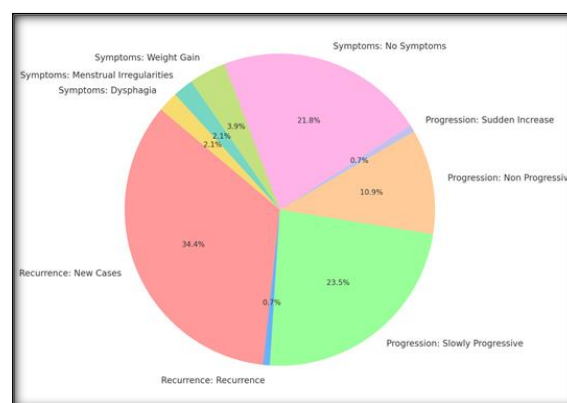


Figure 2: Clinical Radiological Findings

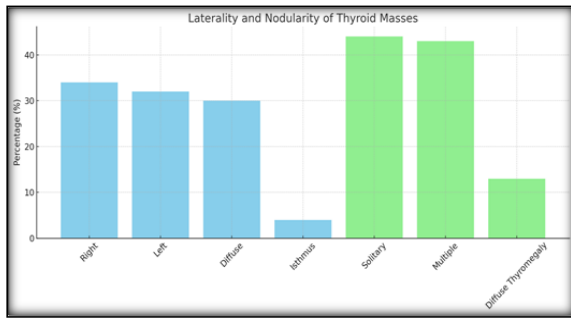


Figure 3: Laterality and Nodularity of Thyroid Masses

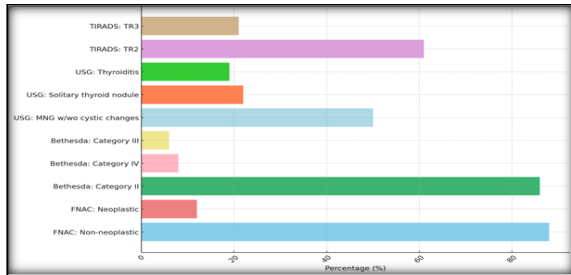


Figure 4: Diagnostic Findings



Figure 5: Right Lobe Multinodular Goiter



Figure 6: Left lobe Solitary Nodule

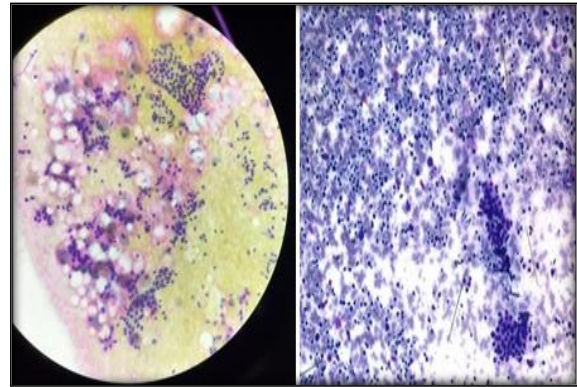


Figure 7: FNAC of Colloid Goiter and Hashimoto's Thyroiditis

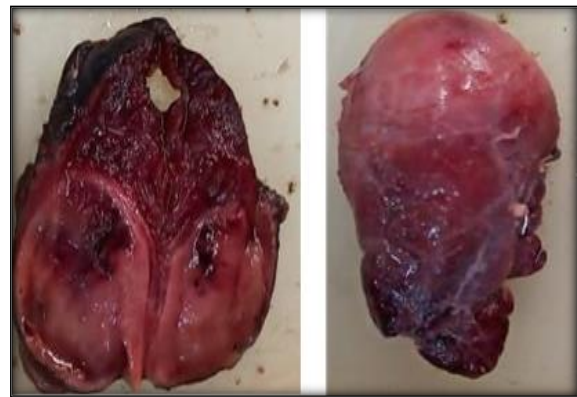


Figure 8: Specimen of Solitary Thyroid Nodule



Figure 9: PREOP and Post Postop Photo of a Male Patient

Table 1: Patient Demographics

Demographic Feature	Details	Percentage
Age Distribution	≤10Y to 61-70Y	-
	31-40Y	29%
	21-30Y	28%
Gender Distribution	Female	92%
	Male	8%

Table 2: Clinical and Radiological Findings

Feature	Category	Percentage
Recurrence After Surgery	New cases	98%
	Recurrence	2%
Progression of Size of Swelling	Slowly progressive	67%
	Non progressive	31%
	Sudden increase	2%

Frequency of Associated Symptoms	No symptoms	62%
	Weight gain	11%
	Menstrual irregularities	6%
	Dysphagia	6%

Table 3: Laterality and Nodularity of Thyroid Masses

Feature	Category	Percentage
Laterality	Right	34%
	Left	32%
	Diffuse	30%
Nodularity	Isthmus	4%
	Solitary	44%
	Multiple	43%
	Diffuse thyromegaly	13%

Table 4: Duration and Thyroid Status

Feature	Category	Percentage
Duration of Symptoms	≤ 1 Y	54%
	2-5 Y	39%
	6-10 Y	6%
	>10 Y	1%
Thyroid Status	Euthyroid	56%
	Hypothyroid	35%
	Hyperthyroid	9%

Table 5: Diagnostic Findings

Diagnostic Method	Finding	Percentage
FNAC Diagnosis	Non-neoplastic	88%
	Neoplastic	12%
Bethesda Classification	Category II	86%
	Category IV	8%
	Category III	6%
USG Diagnosis	MNG w/wo cystic changes	50%
	Solitary thyroid nodule	22%
	Thyroiditis	19%
TIRADS Classification	TR2	61%
	TR3	21%

Table 6: Surgical Intervention and Histopathology

Feature	Category	Percentage
Surgical Intervention	R. HT	18%
	L. HT	15%
	None	67%
Histopathology of Surgically Managed Cases	Non-neoplastic	-
	Benign Neoplastic	-
	Malignant	-

DISCUSSION

This study's findings contribute significantly to our understanding of benign thyroid mass lesions, highlighting crucial aspects of patient demographics, clinical presentation, and diagnostic outcomes. The predominance of females in our study (92%) aligns with previous research, underlining a gender-specific predisposition to thyroid mass lesions.^[8,9] This could be attributed to hormonal influences, particularly during puberty, lactation, and menopause, which are unique to females. Moreover, the dietary habits in certain socioeconomic strata, where females might have a nutrient-deficient diet, could further accentuate this trend.^[10]

Age-wise, the majority of our patients fell into the 31-40 years age bracket, resonating with findings from Warpe et al.^[11] This age distribution may reflect hormonal and metabolic changes occurring in

this demographic, warranting further investigation into age-related factors influencing thyroid pathology. The age range also suggests a need for targeted screening and diagnostic approaches for this age group.^[12]

Clinically, the presence of solitary nodules in 44% of cases and multinodular goitre in 50% of cases, as revealed by ultrasound, is noteworthy. These findings suggest that clinical examination alone may not always be sufficient for assessing thyroid nodularity, underlining the importance of ultrasound as a complementary diagnostic tool. This is particularly relevant in cases where the clinical presentation underestimates the extent of nodularity.^[13]

The thyroid functional status, with a majority being euthyroid (56%), followed by hypothyroid (35%), suggests that thyroid mass lesions can occur across different functional statuses, necessitating a

comprehensive approach to diagnosis and management irrespective of thyroid function.^[14]

Histopathologically, the prevalence of colloid nodular goiter and Hashimoto's thyroiditis as primary diagnoses reinforces the non-neoplastic nature of most benign thyroid masses. This finding underscores the necessity of accurate cytological diagnosis to guide clinical management effectively.^[15]

Regarding surgical intervention, the fact that a significant proportion of patients (33%) underwent surgery, predominantly right and left hemithyroidectomy, indicates a surgical inclination in management. However, the discrepancy between clinical and ultrasound examinations in assessing nodularity raises questions about the criteria used for selecting patients for surgery.

The study's findings on malignancy rates in different Bethesda categories are particularly illuminating. While Bethesda category II had no malignancy, higher categories showed an increased malignancy rate. This emphasizes the need for careful monitoring and follow-up, especially in patients with higher Bethesda categories, as these categories carry a significant risk of malignancy.

Limitations and Future Research

One limitation of this study is its single-centre design, which may not fully represent the broader population. Additionally, the retrospective nature of the study might have inherent biases in data collection and interpretation. Future studies should focus on multicentre data to enhance the generalizability of findings. Also, longitudinal studies assessing the progression of these benign lesions could provide insights into their natural history and inform management strategies

CONCLUSION

In this comprehensive study involving 100 patients afflicted by benign thyroid lesions, our findings underscore significant trends. The age group predominantly affected was 31-40 years, with a striking female-to-male ratio of 11.5:1. Notably, the right lobe exhibited the highest frequency of involvement, and ultrasound emerged as a more adept diagnostic tool compared to clinical examination, especially in the identification of solitary nodules and diffuse thyromegaly. A majority of patients presented with euthyroid status, and colloid nodular goiter emerged as the prevailing non-neoplastic lesion. Importantly, our research emphasizes the pivotal role of surgical intervention in securing precise diagnoses, with malignancy rates of 16.66% to 25% observed in Bethesda categories III and IV. These findings hold significant implications for clinical practice and further research in the field of thyroid pathology.

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