

CLINICOPATHOLOGICAL STUDY OF THYROID LESIONS

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Abstract

Background: Multinodular Goiter (MNG) is a prevalent thyroid disorder characterized by the formation of multiple nodules within the thyroid gland. This study focuses on exploring the clinicohistopathological characteristics of MNG to enhance the understanding of its clinical presentations and histopathological features. **Material and Methods:** The study included 50 patients diagnosed with MNG. Variables such as age, sex incidence, duration of swelling, progression, mode of presentation, pain incidence, toxic symptoms, pressure symptoms, thyroid profile, tracheal shift, and Fine Needle Aspiration Cytology (FNAC) findings were meticulously analyzed. Furthermore, a detailed histopathological examination of thyroidectomy specimens was performed. **Results:** The findings highlighted a female predominance (86%) within the age groups of 30-40 years (32%) and 40-50 years (34%). A significant majority of the patients exhibited a gradual progression of swelling (88%) and reported with a neck swelling (100%). Painful swellings were common (86%), and toxic symptoms were observed in a considerable number of patients (86%), with difficulty in breathing identified as the most frequent pressure symptom (4%). Thyroid function tests were largely within normal limits for the majority, with 98% showing a central tracheal position. FNAC results predominantly indicated colloid goitre (80%). Histopathological analysis confirmed colloid goitre as the major histopathological finding (84%). **Conclusion:** The study provides detailed understanding into the clinicohistopathological features of Multinodular Goiter, highlighting the significance of thorough clinical evaluation and histopathological examination in understanding the spectrum of thyroid lesions. This approach is pivotal for the accurate diagnosis and characterization of MNG, facilitating further research and enhancing patient care in the realm of thyroid disorders.

INTRODUCTION

Multinodular Goiter (MNG) is among the most prevalent thyroid disorders globally, marked by the development of multiple nodules within the thyroid gland.^[1] This condition represents a substantial health concern due to its widespread occurrence, the potential for complications, and its effect on the quality of life of affected individuals.^[2] Despite its frequency, the clinicohistopathological

characteristics of MNG and other thyroid lesions are the focus of continuous scientific investigation.^[3]

The causes behind MNG and various thyroid lesions are complex and multifaceted, incorporating genetic factors, iodine deficiency, autoimmune conditions, and environmental influences.^[4,5] The presence of multiple nodules raises concerns about the potential for malignancy within the thyroid gland, highlighting the necessity for comprehensive

evaluation and precise characterization of these lesions.^[6]

Patients with MNG and other thyroid disorders can present with a broad spectrum of symptoms. These may range from being completely asymptomatic to exhibiting signs and symptoms due to the size of the nodules, compression of nearby structures, or hormonal imbalances.^[7] Symptoms commonly observed include neck swelling, difficulty swallowing (dysphagia), breathing problems (dyspnea), and changes in voice (dysphonia). Diagnostic approaches, such as thyroid function tests, ultrasound imaging, and Fine-Needle Aspiration Cytology (FNAC), are crucial in the assessment and classification of thyroid lesions.^[8]

In regions like India, where iodine deficiency is prevalent, thyroid disorders such as MNG present significant public health challenges. However, detailed studies focusing exclusively on the Clinicopathological features of these conditions are scarce, particularly within specific geographic settings.

This study seeks to address this knowledge gap by performing a retrospective observational analysis of patients diagnosed with MNG and other thyroid lesions treated at Andhra Medical College, Andhra Pradesh, India. The objective is to delineate the epidemiology, clinical presentations, and histopathological characteristics of thyroid lesions in this population. Through this research, we aim to enhance the understanding of the clinicopathological dynamics of thyroid disorders, thereby contributing valuable insights toward their diagnosis and characterization.

MATERIALS AND METHODS

Study Setting

A retrospective observational study was designed to explore the clinicopathological characteristics of thyroid lesions, with a particular focus on Multinodular Goiter (MNG).

Study Period and Location: The research was conducted at Andhra Medical College in Visakhapatnam, Andhra Pradesh, India, covering a period from March 2023 to February 2024.

Study Population: Patients diagnosed with thyroid lesions, including MNG, and treated at the Department of Pathology within the study timeframe were included.

Data Collection: Information was collected from medical records, encompassing demographic details, clinical presentation, duration of swelling, thyroid profile, tracheal shift, and findings from Fine-Needle Aspiration Cytology (FNAC). Data specific to the type of thyroidectomy and postoperative outcomes were omitted to align with the study's clinicopathological focus.

Histopathological Examination: A thorough histopathological analysis of the thyroidectomy specimens was performed to ascertain the

characteristics of the nodules and establish the diagnosis. This process involved the standard procedures of processing, staining, and examination by seasoned pathologists.

Data Analysis: The study utilized descriptive statistics to articulate the demographic data, clinical manifestations, and histopathological results of the participants. This included calculating frequencies and percentages for categorical variables, along with averages and variations for continuous data.

Statistical Analysis: The SPSS software was employed for data analysis. Statistical tests such as the Chi-square test, t-test, and their non-parametric alternatives were applied to explore relationships and differences among variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic and Clinical Characteristics

The study encompassed a cohort of 50 patients diagnosed with thyroid lesions, with a conspicuous predominance of females (43 out of 50 patients, 86%). The age distribution indicated a higher incidence in the 30-50 age group, with 32% (16 patients) aged between 30-40 years and 34% (17 patients) between 40-50 years. The duration of swelling prior to diagnosis varied significantly, with 26% (13 patients) reporting swelling for 1-6 months, 32% (16 patients) for 6-12 months, 34% (17 patients) for 1-2 years, and 8% (4 patients) for 2-5 years (Table 1).

Clinical Presentation and Pathological Features

Upon presentation, all patients (100%) exhibited neck swelling. The progression of swelling was gradual in 88% of cases, rapid in 4%, and stationary in 8%. Symptomatically, 86% reported painful swelling, while 14% experienced painless swelling. Among the cohort, 86% exhibited toxic symptoms, and pressure symptoms were observed in a minority, with 4% reporting difficulty in breathing and 2% experiencing difficulty in swallowing (Table 2).

Thyroid Function and Diagnostic Findings

Thyroid function tests predominantly returned normal (T3, T4, TSH), with specific abnormalities detailed in the respective categories. A central tracheal position was noted in 98% of patients, suggesting minimal tracheal deviation due to thyroid lesions. Fine-Needle Aspiration Cytology (FNAC) findings revealed that colloid goitre was the most common pathology, accounting for 80% of cases. Other findings included Hashimoto's Thyroiditis (8%) and Follicular Neoplasms (6%) (Table 4).

Histopathological Examination

The histopathological examination of thyroidectomy specimens provided a detailed view of the underlying pathology. Colloid goitre was confirmed in 84% of cases. Other notable findings included Lymphocytic Thyroiditis (2%), Papillary Carcinoma (2%), Follicular Carcinoma (4%), and Follicular Adenoma (8%), underscoring the varied

histopathological spectrum of thyroid lesions (Table 6).

Table 1: Age, Sex Incidence, and Duration of Swelling

Age Group	Male	Female	Total	Duration of Swelling
20-30	3	10	13	1-6 months
30-40	2	14	16	6-12 months
40-50	2	15	17	1-2 years
51+	0	4	4	2-5 years
Total	7	43	50	-

Table 2: Progression, Mode of Presentation, and Pain Incidence

Progression of Swelling

Progression	Percentage
Gradual	88%
Rapid	4%
Stationary	8%

Mode of Presentation

Mode	Percentage
Neck Swelling	100%
Thyrotoxicosis Symptoms	24%
Hypothyroid Symptoms	10%

Pain Incidence

Pain Incidence	Percentage
Painful Swelling	86%
Painless Swelling	14%

Table 3: Incidence of Toxic Symptoms and Pressure Symptoms

Toxic Symptoms

Toxic Symptoms	Percentage
With Toxicity	86%
Without Toxicity	64%

Pressure Symptoms

Pressure Symptoms	Percentage
Difficulty in Breathing	4%
Difficulty in Swallowing	2%

Table 4: Thyroid Profile, Tracheal Shift, and FNAC Findings

Thyroid Profile (T3, T4, TSH)

Parameter	Normal	Increased	Decreased
T3	N	I	D
T4	N	I	D
TSH	N	I	D

Tracheal Shift

Tracheal Shift	Percentage
Tracheal Central	98%
Trachea Shifted to Left	2%
Trachea Shifted to Right	0%

FNAC Findings

FNAC Findings	Percentage
Colloid Goitre	80%
Hashimoto's Thyroiditis	8%
Follicular Neoplasms	6%

Table 6: Histopathology (HPE) of Thyroidectomy Specimens

Parameter	Total Cases	Percentage
Colloid Goitre	42	84%
Lymphocytic Thyroiditis	1	2%
Papillary Carcinoma	1	2%
Follicular Carcinoma	2	4%
Follicular Adenoma	4	8%
Total	50	100%

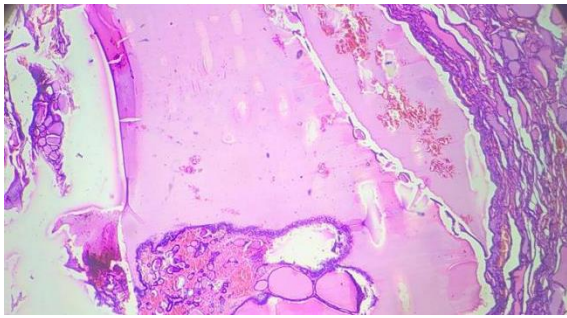


Figure No: 1 Colloid Goitre

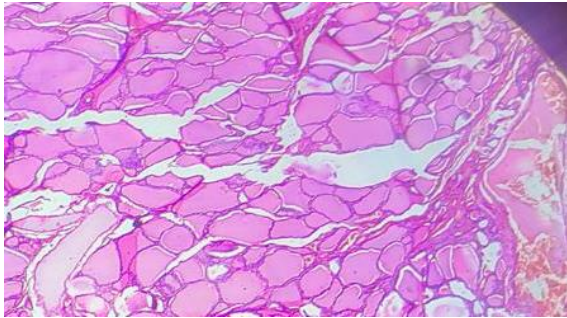


Figure No: 2 Multi Nodular Goitre

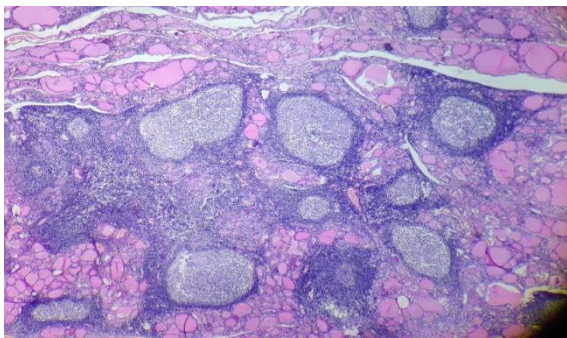


Figure No: 3 Lymphocytic thyroiditis

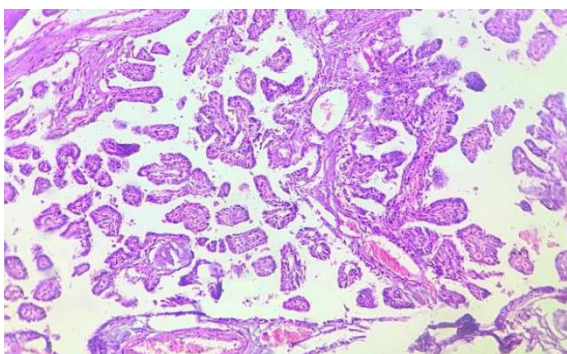


Figure No: 4 Low power Papillary Thyroid Carcinoma

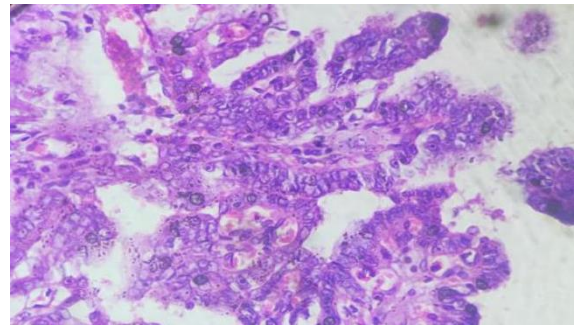


Figure No: 5 High power view of papillary thyroid carcinoma

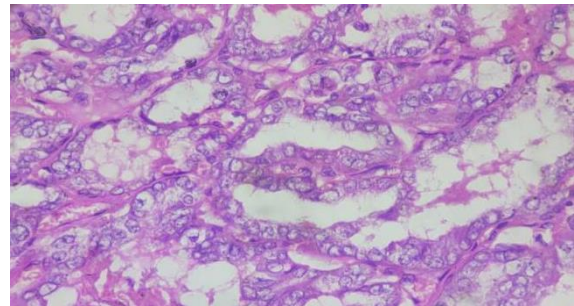


Figure No: 6 Follicular variant of papillary thyroid carcinoma

DISCUSSION

The findings from this clinicopathological study of thyroid lesions, with a focus on Multinodular Goiter (MNG), provide deep insights into the epidemiology, clinical characteristics, diagnostic methods, and histopathological features of these conditions. This discussion aims to contextualize these findings within the broader literature, offering a comparative analysis and outlining the implications for future research.

Epidemiology and Clinical Characteristics: Consistent with existing literature, our study underscores the higher incidence of thyroid lesions, including MNG, among females, which resonates with the recognized gender predisposition in thyroid disorders. The noted peak incidence within the 30-50 years age bracket aligns with established patterns, suggesting hormonal or reproductive factors may influence disease development.^[9] The early presentation of patients, often within 1-6 months of symptom onset, emphasizes the palpable nature of thyroid lesions and the necessity for prompt clinical evaluation.^[10]

Diagnostic Approaches: The reliance on clinical examination, supported by thyroid function tests and Fine-Needle Aspiration Cytology (FNAC), is validated in our findings. The high prevalence of colloid goitre among FNAC results mirrors the benign propensity of most thyroid lesions, underscoring the critical role of these diagnostic tools in differentiating benign from potentially malignant nodules.^[11] This diagnostic pathway ensures accurate risk stratification, which is essential for guiding clinical decisions.

Histopathological Features: The histopathological examination reveals a predominance of benign pathologies, such as colloid goitre, which aligns with the benign nature of most thyroid lesions encountered in clinical practice.^[12] Nevertheless, the identification of malignant cases, albeit rare, including follicular and papillary carcinomas, illustrates the indispensable role of histopathology. These findings highlight the spectrum of thyroid lesions, from benign to malignant, necessitating comprehensive histopathological evaluation for definitive diagnosis and assessment of malignancy risk.^[13]

Clinical Relevance: Our study's clinicopathological focus enriches the understanding of thyroid lesions' nature and behavior, offering critical insights for clinicians and pathologists. The detailed characterization of these lesions aids in refining diagnostic accuracy, optimizing patient counseling, and tailoring follow-up strategies. Moreover, it underscores the necessity for a multidisciplinary approach in evaluating and managing patients with thyroid lesions, integrating expertise from endocrinology, pathology, and radiology to ensure comprehensive care.

Future Directions: The insights garnered from this study pave the way for future investigations into the clinicopathological aspects of thyroid lesions. Prospective research could explore the genetic and molecular underpinnings of these conditions, the impact of environmental and dietary factors on their prevalence, and the development of advanced diagnostic markers for early detection and risk stratification of malignant potential. Additionally, studies assessing the long-term clinical outcomes and quality of life post-diagnosis will further contribute to the holistic management of thyroid lesions.

CONCLUSION

This clinicopathological study significantly advances our understanding of thyroid lesions, shedding light on their epidemiology, clinical presentations, diagnostic pathways, and histopathological features. By delineating the complex landscape of these conditions, the research offers a foundation for enhancing diagnostic precision, guiding clinical management, and informing future scientific inquiries in the realm of thyroid pathology.

REFERENCES

1. Chaudhary M, Baisakhiya N, Singh G. Clinicopathological and Radiological Study of Thyroid Swelling. *Indian J Otolaryngol Head Neck Surg.* 2019 Oct;71(Suppl 1):893-904. doi: 10.1007/s12070-019-01616-y. Epub 2019 Feb 8. PMID: 31742091; PMCID: PMC6848553.
2. Chen Q, Su A, Zou X, Liu F, Gong R, Zhu J, Li Z, Wei T. Clinicopathologic Characteristics and Outcomes of Massive Multinodular Goiter: A Retrospective Cohort Study. *Front Endocrinol (Lausanne).* 2022 May 24;13:850235. doi: 10.3389/fendo.2022.850235. PMID: 35685217; PMCID: PMC9170891.
3. Lin YS, Wu HY, Yu MC, Hsu CC, Chao TC. Patient outcomes following surgical management of multinodular goiter: Does multinodularity increase the risk of thyroid malignancy? *Medicine (Baltimore).* 2016 Jul;95(28):e4194. doi: 10.1097/MD.00000000000004194. PMID: 27428220; PMCID: PMC4956814.
4. Gupta S, Vasu Reddy C, Chettri ST, Karki S. Clinicopathological features and complications of thyroid operations: a single centre experience. *Indian J Otolaryngol Head Neck Surg.* 2013 Apr;65(2):140-5. doi: 10.1007/s12070-012-0609-3. Epub 2012 Dec 22. PMID: 24427554; PMCID: PMC3649034.
5. Prades JM, Dumollard JM, Timoshenko A, Chelikh L, Michel F, Estour B, Martin C. Multinodular goiter: surgical management and histopathological findings. *Eur Arch Otorhinolaryngol.* 2002 Apr;259(4):217-21. doi: 10.1007/s00405-002-0455-0. PMID: 12064511.
6. Lame CA, Atila M, Dembele B, Obeng MK. Management of a Long-Standing Huge Goiter During a Humanitarian Mission: A Case Report. *Cureus.* 2023 May 23;15(5):e39365. doi: 10.7759/cureus.39365. PMID: 37362472; PMCID: PMC10285428.
7. LiVolsi VA, Baloch ZW. The Pathology of Hyperthyroidism. *Front Endocrinol (Lausanne).* 2018 Dec 3;9:737. doi: 10.3389/fendo.2018.00737. PMID: 30559722; PMCID: PMC6286962.
8. Day TA, Chu A, Hoang KG. Multinodular goiter. *Otolaryngol Clin North Am.* 2003 Feb;36(1):35-54. doi: 10.1016/s0030-6665(02)00157-3. PMID: 12803008.
9. Elhassan MMA, Gismalla MDA, Mohamed SAH et al. Clinicopathological profile and management of thyroid carcinoma: a Sub-Saharan country experience. *Thyroid Res.* 2023;16:35. <https://doi.org/10.1186/s13044-023-00173-5>.
10. Qari FA. Multinodular goiter management in Western Saudi Arabia. *Saudi Med J.* 2005 Mar;26(3):438-41. PMID: 15806215.
11. Danila R, Livadariu RM, Timofte DV, Trifescu I, Bibire T, Ghiga G, Ciobanu D, Ionescu L. Clinicopathological Characteristics of Incidental Papillary Thyroid Microcarcinoma in an Endemic Goiter Area. *Applied Sciences.* 2020; 10(16):5532. <https://doi.org/10.3390/app10165532>.
12. Syrenicz A, Koziółek M, Ciechanowicz A et al. New insights into the diagnosis of nodular goiter. *Thyroid Res.* 2014;7:6. <https://doi.org/10.1186/1756-6614-7-6>.
13. Agarwal S, Bychkov A, Jung C-K. Emerging Biomarkers in Thyroid Practice and Research. *Cancers.* 2022; 14(1):204. <https://doi.org/10.3390/cancers14010204>.