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ISSN: 2617-0817 E-ISSN: 2789-5912

Original Article

# Clinicopathological Spectrum of Thyroid Swelling — A Study at Monno Medical College and Hospital in Bangladesh

DOI: dx.doi.org

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**Received:** 28 Jan 2024
**Accepted:** 4 Feb 2024
**Published:** 14 Nov 2024

**Published by:**
Sher-E-Bangla Medical College, Barishal, Bangladesh

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***ABSTRACT***

***Introduction:*** *The thyroid gland is essential for metabolic regulation and endocrine function. Thyroid swelling, or goiter, can present with various clinical manifestations and pathological features. The clinicopathological spectrum of thyroid swellings includes benign conditions like multinodular goiter and thyroiditis, as well as malignant disorders such as thyroid carcinomas. This study aimed to explore the wide-ranging clinical and pathological aspects of thyroid swellings.* ***Methods & Materials:*** *This prospective study was conducted in the Department of ENT & HNS, Monno Medical College and Hospital, Manikganj, Bangladesh from January, 2019 to December, 2023. For this study, 90 resected specimens from thyroid surgeries were enrolled as subjects. A purposive sampling technique was utilized for sample selection. Data analysis was conducted using MS Office tools.* ***Results:*** *Clinically, 54.4% and as per ultrasonography, 78.9% of cases had solid consistency of swelling; 90.0% of the cases were euthyroid. The left lobe was involved in 45.5% of cases, and the right lobe in 42.5%. As per the fine needle aspiration cytology of thyroid nodules, 43.3% were benign, and 5.6% were malignant cases.* ***Conclusion:*** *Among thyroid swelling cases, solid consistency is very common. The involvement of the right and left lobes occurs with nearly equal frequency, accounting for nearly half of the cases. In approximately 5% of these cases, malignancy may be found.*

***Keywords:*** *Clinicopathological spectrum, Thyroid swelling, Solid, Euthyroid, Colloid goiter, malignancy*

*(The Planet 2023; 7(2): 46-48)*

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## INTRODUCTION

The incidence of thyroid cancer has surged significantly over the past thirty years, now ranking as the fastest-growing cancer in women[1]. In Bangladesh, particularly in the North Bengal region, iodine deficiency goiter is prevalent, contributing to the etiology of thyroid cancer. Patients generally exhibit visible neck swelling that moves with deglutition. Standard investigative procedures for patients with thyroid swelling include thyroid gland ultrasonography, serum TSH assessments, and FNAC (Fine Needle Aspiration Cytology). Definitive diagnosis necessitates a morphological examination, thereby mandating histopathological analysis[2]. In 1870, Rugu and his associate Joham Vent first introduced surgical biopsy as an essential diagnostic tool[3]. The technique for FNAC (Fine Needle Aspiration Cytology) was initially described by Leyden in 1883[4]. However, the application of aspiration cytology for diagnosing thyroid swellings was first documented by Martin and Ellis in 1930[5]. Despite its utility, FNAC has limitations, including issues with specimen adequacy, sampling techniques, the skill level of the operator, interpretation challenges, and overlapping cytological features between benign and malignant follicular neoplasms. It is also limited in detecting certain papillary carcinomas when associated with other pathologies such as multi-nodular goiter and cystic changes[6]. Mundasad et al. conducted a comparative study between FNAC and histopathology, finding that FNAC had a sensitivity of 52.6%, specificity of 86.6%, and accuracy of 79.1% for diagnosing thyroid malignancy[7]. The prevalence of thyroid carcinoma within thyroid swellings varies widely across different studies, with reported rates ranging from 5% to 30%. Factors such as age, gender, family history of thyroid cancer, radiation exposure, and the presence of high-risk features (e.g., larger nodule size, solid composition, micro-calcifications) contribute to the likelihood of malignancy within thyroid swellings[8,9]. The objective of this study was to assess the clinicopathological spectrum of thyroid swelling.

ISSN: 2617-0817 E-ISSN: 2789-5912

## METHODS & MATERIALS

This was a prospective hospital-based study that was conducted in the Department of ENT & HNS, Monno Medical College and Hospital, Manikganj, Bangladesh from January, 2019 to December, 2023. A total of 90 resected thyroid surgery specimens were enrolled as subjects in this study, selected via purposive sampling. Written consent was appropriately obtained from all participants before data collection. The inclusion criteria specified that patients with thyroid swelling and a normal thyroid hormone profile who were undergoing thyroidectomy were included. Conversely, the exclusion criteria for this study included patients with comorbidities, patients unfit for surgery, those who refused surgery, and individuals with inoperable thyroid malignancies. Fine needle aspiration cytology (FNAC) tests and ultrasonographic evaluation were performed for all the participants. Data analysis was conducted using MS Office tools.

## RESULT

In the current study, the highest number of patients (42.2%) were from the >40 years age group followed by 37.8% from the 31-40 years age group. Most of the patients were female (61%) and the rest 39% of the cases were male. Upon analyzing the clinical conditions of the cases, it was observed that most of the cases (54.4%) had solid consistency of swelling, nearly one-fourth of cases (24.4%) had mixed consistency and the rest of the patients (21.1%) had cystic swelling. On the other hand, ultrasonographic findings regarding thyroid swelling showed that 78.9% of the cases were solid in nature. Mixed cases accounted for 12.2% of the observations, while cystic cases comprised 8.9%. The distribution of baseline thyroid stimulating hormone (TSH) levels indicated that 90.0% of the cases were euthyroid. Hypothyroid cases accounted for 6.7%, while hyperthyroid cases comprised 3.3%. The distribution of swelling history indicated that 52.2% of cases reported swelling only. Cases of swelling with dysphagia accounted for 24.4% while swelling with pain was reported in 21.1% of cases. Additionally, 2.2% of cases reported swelling with fever. Among the total cases, the left lobe was involved in 45.5% of cases, the right lobe in 42.5%, and both lobes (bilateral) in 3% of cases. Fine needle aspiration cytology (FNAC) interpretations of thyroid nodules showed that 43.3% were benign. Malignant cases accounted for 5.6%. Interpretations that were suspicious of neoplasia comprised 15.6%, while unsatisfactory aspirations were reported in 18.9% of cases. Indeterminate interpretations of neoplasia made up 16.7% of the findings.

**Table – I: Age Distribution of Participants**

| Age (Year) | *n* | % |
|---|---|---|
| <20 | 3 | 3.3 |
| 21-30 | 15 | 16.7 |
| 31-40 | 34 | 37.8 |
| >40 | 38 | 42.2 |
| Total | 90 | 100 |

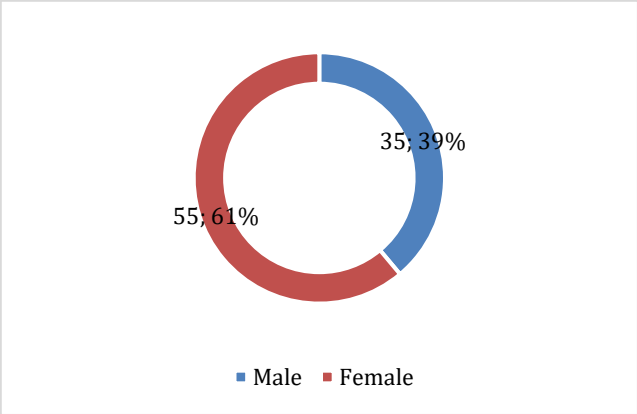


**Figure – 1: Gender Distribution**

**Table – II: Distribution of Swelling Status**

| Clinical findings | *n* | % |
|---|---|---|
| Cystic | 19 | 21.1 |
| Solid | 49 | 54.4 |
| Mixed | 22 | 24.4 |

**Table – III: USG Findings on Swelling**

| USG findings | *n* | % |
|---|---|---|
| Cystic | 8 | 8.9 |
| Solid | 71 | 78.9 |
| Mixed | 11 | 12.2 |

**Table – IV: Distribution of Baseline TSH**

| Baseline TSH | *n* | % |
|---|---|---|
| Hypothyroid | 6 | 6.7 |
| Euthyroid | 81 | 90.0 |
| Hyperthyroid | 3 | 3.3 |

**Table – V: Distribution of Swelling History**

| History | *n* | % |
|---|---|---|
| Swelling only | 47 | 52.2 |
| Swelling with pain | 19 | 21.1 |
| Swelling with fever | 2 | 2.2 |
| Swelling with dysphagia | 22 | 24.4 |

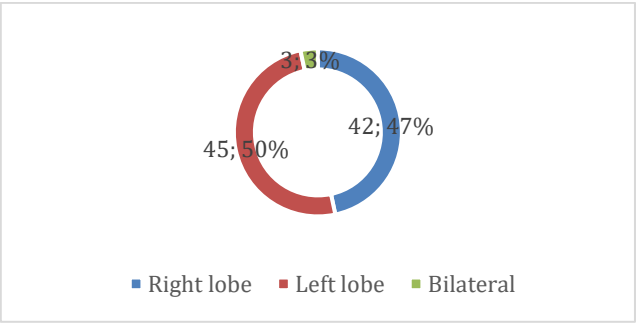


**Figure – 2: Distribution of location**

ISSN: 2617-0817 E-ISSN: 2789-5912

**Table – VI: FNAC interpretation of thyroid nodules**

| FNAC Interpretation | n | % |
|---|---|---|
| Benign | 39 | 43.3 |
| Malignant | 5 | 5.6 |
| Suspicious of neoplasia | 14 | 15.6 |
| Unsatisfactory aspiration | 17 | 18.9 |
| Indeterminate of neoplasia | 15 | 16.7 |

## DISCUSSION

In the current study, the majority of patients (42.2%) were from the >40 years age group, followed by 37.8% from the 31-40 years age group. Nearly similar settings were observed in another study[10]. In our study, the gender distribution of cases revealed that the majority of patients were female, comprising 61%, while males accounted for the remaining 39%. These findings were consistent with those reported in another study [11]. Upon examining the clinical conditions of our cases, it was found that the majority of patients (54.4%) exhibited solid swellings, approximately one-fourth (24.4%) displayed mixed consistency, and the remaining patients (21.1%) presented with cystic swellings. Comparable findings were noted in another study[12]. In this study, ultrasonographic findings of thyroid swellings revealed that 78.9% of the cases were solid in nature. Mixed consistency was observed in 12.2% of the cases, while cystic cases comprised 8.9%. A previous study confirmed similar results, with 81.13% of patients demonstrating solid consistency[12]. Among our total participants, 90.0% of the cases were euthyroid, 6.7% were hypothyroid, and 3.3% were hyperthyroid. These results are consistent with findings reported in other published literature[13]. In this setting, the distribution of swelling history showed that 52.2% of cases reported swelling only. In contrast, the study by Pal R et al. reported that 93.2% of cases presented with neck swelling only[14]. Among our cases, the left lobe was involved in 45.5%, the right lobe in 42.5%, and both lobes (bilateral) in 3%. In contrast, some studies have found the right lobe to be more frequently affected[15,16]. In this study, Fine Needle Aspiration Cytology (FNAC) of thyroid nodules revealed that 43.3% were benign and 5.6% were malignant. Suspicious neoplasia accounted for 15.6%, while unsatisfactory aspirations were reported in 18.9% of cases. Additionally, indeterminate neoplasia interpretations comprised 16.7% of the findings. Similar findings were observed in a previous study[12]. The findings of this current study may be useful for future similar studies.

### Limitation of the study:

This was a single-centered study with a small sample size and was conducted over a very short period. Therefore, the findings may not accurately represent the scenario of the entire country.

## CONCLUSION

Solid consistency is highly prevalent among thyroid swelling cases, affecting nearly half of the patients across both the right and left lobes with roughly equal frequency. This highlights the importance of comprehensive evaluation for both lobes during diagnosis. While the majority of cases are benign, it is crucial to recognize that approximately 5% of these thyroid swellings may harbor malignancy. Therefore, vigilant and thorough assessment remains essential to ensure early detection and appropriate management of potential malignant transformations within thyroid swellings.

**Funding:** No funding sources.
**Conflict of interest:** None declared.

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