

DELVING INTO THE THYROID LESION INCIDENCE IN FEMALE WITH CYTOHISTOLOGICAL CORRELATION - AN INTRICATE EXPLORATION.

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ABSTRACT :

One of the common presentation in ENT outpatient departments is swelling of neck, posing noteworthy risks if mismanaged. Thyroid swellings, being predominant, prompted our prospective study on the part of fine-needle aspiration cytology (FNAC) in diagnosing them and comparing its efficacy against histopathological findings. Our findings indicate FNAC's high reliability, sensitivity, and specificity in diagnosing thyroid swellings.

INTRODUCTION :

Neck swellings present a diagnostic challenge in ENT due to diverse causes, including common thyroid disorders. Fine-needle aspiration cytology (FNAC) is a important and crucial for negligibly intrusive evaluation of swelling of thyroid. Our research work aims to evaluate FNAC's precision in diagnosing thyroid swellings and compare it with histopathology, validating FNAC as a reliable diagnostic tool, especially in resource-constrained settings.

METHODOLOGY :

A prospective study was conducted at our ENT clinic involving patients with thyroid swellings. FNAC was performed on each patient, and results were compared with subsequent histopathological analysis from surgical specimens. Data on FNAC's sensitivity, specificity, and diagnostic accuracy for benign and malignant thyroid swellings were analyzed using statistical methods to assess concordance with histopathology.

CONCLUSION :

Our study underscores FNAC's reliability as a primary diagnostic tool for thyroid swellings, demonstrating sensitivity and specificity comparable to histopathology. FNAC provides clinicians with a rapid and accurate means to differentiate benign from malignant thyroid conditions. This study supports FNAC's widespread adoption in clinical practice, particularly in resource-limited settings, enhancing the timely and effective management of thyroid swellings.

KEYWORDS : Colloid nodules, fine-needle aspiration cytology (FNAC), histological examination , Well being .

INTRODUCTION:

Neck swelling frequently appears in ENT practice and can present major health risks if not treated properly, potentially resulting in morbidity and even death(1). Of the different forms of neck swellings, thyroid enlargement is notably the most common.(2,3) In our prospective study, we sought to evaluate the diagnostic significance of FNAC

(Fine Needle Aspiration Cytology) for patient welfare in identifying the characteristics of thyroid swellings and to contrast its diagnostic precision with histopathological results.

Our results highlight the dependability of FNAC as a diagnostic tool for thyroid enlargements, showing significant sensitivity and specificity(4). FNAC has demonstrated its worth as an effective method for differentiating between benign and malignant thyroid disorders, assisting healthcare providers in making knowledgeable choices about patient care, treatment plans, and Global health (5). By delivering precise and prompt diagnostic data, FNAC is essential in enhancing patient care and outcomes regarding thyroid enlargements. (6)

In clinical practice, neck swellings are a common presentation, with thyroid enlargement being predominant(3). However, accurate diagnosis and management become challenging when the swelling originates from sources other than the thyroid (5). Beyond cosmetic concerns, neck swellings can exert pressure on vital structures like the trachea, esophagus, and major blood vessels, subject to their dimensions and histopathological characteristics(7). Biopsy, particularly in cases of adenomas, may be necessary to definitively exclude malignancy.

The use of surgical biopsy as a diagnostic tool was first advocated by Rugu. Today, this technique is globally recognized and widely practiced, particularly in evaluating thyroid, lymph node, and breast swellings. Fine needle aspiration cytology (FNAC) is a common investigative method, yet it has limitations such as false negatives and false positives(8). and have compared FNAC with histopathology, demonstrating varying degrees of accuracy. reported extraordinary sensitivity and specificity of FNAC in identifying thyroid malignancies. Thus, while FNAC remains a valuable initial diagnostic step(9), its limitations underscore the importance of biopsy in cases where clinical suspicion for malignancy persists(10)

AIM AND OBJECTIVES :

Examine the clinical evaluation of various types of thyroid swellings and explore the relationship between fine-needle aspiration cytology (FNAC) and histopathology in diagnosing these thyroid swellings.

MATERIALS AND METHODS :

The current study is a prospective investigation involving 66 patients conducted jointly by the departments of ENT – Head and Neck Surgery and Pathology at Saveetha Medical College and Research Institute. The study focused on evaluating different swellings of neck attending the otorhinolaryngology OPD through thorough clinical examinations and detailed history-taking.

FNAC was done in all patients identified with neck swelling, thyroid in particular and were subsequently admitted for further evaluation and surgical intervention, if deemed necessary. Post-operatively, specimens were examined histopathologically and compared with preoperative FNAC reports. Patients with non-thyroid neck swellings were excluded.

All 65 patients who took part in our study provided their informed consent to participate. Thyroid swellings that could be felt were recorded according to features like quantity, dimensions, location, firmness, ability to move during palpation, impact on swallowing, surface quality, and presence of soreness. Furthermore, every patient had an ultrasound of the thyroid gland and evaluations of their thyroid hormone levels. Statistical analysis was done using SPSS version 24.0, descriptive statistics done using percentiles wherever needed.

RESULT :

FNAC samples and histopathological specimens were processed and analyzed at the Pathology Department of Saveetha Medical College, Thandalam, SIMATS.

TABLE 1: Frequency of Midline Swelling Among Hospitalized Patients

TOTAL NUMBER OF CASES	MIDLINE SWELLING	%
987	65	6.5 %

Colloid nodules emerged as the predominant type of thyroid swelling in this study, constituting 52.46% of cases, followed by follicular nodules with cystic degeneration at 16.39%. Among the 66 cases analyzed, 45 were female and 16 were male, with the highest occurrence observed in individuals aged between 20-0 years of age.

Interestingly, this contrasts with findings reported by Bhansali [5], where the peak incidence was noted in individuals in their fifth decade. The M:F ratio in our study is 1:2.3, underscoring a higher prevalence of thyroid swellings among females compared to males.

TABLE 2: Types of Thyroid Swelling Incidence Based on FNAC Findings

TYPE OF THYROID SWELLING	NO. OF CASES	%
Colloid Nodule	30	52.46
Follicular nodule with cystic degeneration	12	16.39
Hashimoto's Thyroiditis	10	13.11
Follicular lesion of undetermined significance	8	9.84
Papillary Thyroid Carcinoma	5	8.20
	65	100

In a comprehensive investigation involving 65 patients diagnosed with swelling of thyroid who had undergone surgical intervention and consequent histopathological evaluation, our work revealed that 62 cases demonstrated consistent findings in both FNAC and histopathology. However, in three cases, discrepancies were noted where FNAC results did not align with the histopathological findings.

The overall predictive accurateness of FNAC for swelling of thyroid in our study was calculated at 96.05%, indicating a high level of concordance between preoperative FNAC assessments and postoperative histopathological analyses. This finding resonates with similar studies, such as those conducted by Altavilla et al., which reported a diagnostic accuracy of 92.86%, and Handa et al.

Moreover, the study by Grant et al. highlighted a notably low false-negative rate of 0.7% among malignant cases. Papillary carcinoma was identified as the predominant malignancy, constituting 71.4% of cases, followed by follicular carcinoma at 28.6%. These findings underscore the reliability of FNAC as a investigative method for identifying thyroid malignancies, contributing valuable insights into in hospital treatment of thyroid nodules.

TABLE 3

TYPE OF THYROID SWELLING	TOTAL NUMBER OF CASES	MALE	%	FEMALE	%
Colloid Nodule	30	06	18.7	26	81.3
Follicular nodule with cystic degeneration	12	4	40	6	60
Hashimoto's Thyroiditis	10	3	37.5	5	62.5
Follicular lesion of undetermined significance	8	2	33.3	4	66.7
Papillary Thyroid Carcinoma	5	1	20	4	80
Total	65	16		45	

In Table 4 of the study, a detailed analysis of the association between FNAC and histological diagnoses with thyroid swellings was conducted. The findings revealed that fine-needle aspiration cytology (FNAC) accurately identified 29 out of 30 cases diagnosed as colloid goiter. However, there was one notable discrepancy: a case initially categorized as a colloid nodule based on FNAC results was later found to be papillary carcinoma upon histopathological examination.

This discrepancy underscores the inherent challenge in diagnosing thyroid nodules solely through FNAC, particularly when faced with cases that present with features overlapping between benign and malignant conditions. Such instances highlight the importance of thorough clinical evaluation, including detailed cytological and histological analyses, to ensure accurate identification and appropriate treatment of patients having thyroid nodules.

TABLE 4

Types of neck swelling diagnosed by FNAC	No.of Cytological diagnosis	Correct cytological diagnosis	False Cytodiagnosis	Histopathology findings in cases of false cytodiagnosis
Colloid Nodule	30	29	1	Papillary Carcinoma
Follicular nodule with cystic degeneration	12	12		
Hashimoto's Thyroiditis	10	10		
Follicular lesion of undetermined significance	8	6	2	Follicular carcinoma
Papillary Thyroid Carcinoma	5	5		

DISCUSSION :

The research found that midline swellings represented 6.5% of patients admitted to the hospital (65 out of 987 cases). Colloid nodules were the most common type of thyroid swellings, making up 52.46% of cases, while follicular nodules exhibiting cystic degeneration accounted for 16.39%. This distribution trend offers important information about the epidemiological characteristics of thyroid conditions in the examined population.

The gender breakdown indicated a significant female dominance, with a male-to-female ratio of 1:2.3, reinforcing the widely recognized greater occurrence of thyroid disorders in women. The most frequent occurrence was noted in patients between 20-30 years old, contrasting with Bhansali's results that indicated a peak incidence in the fifth decade of life. This difference may require additional examination of regional, genetic, or environmental elements that might affect the age at which conditions begin.

The research shows the excellent diagnostic reliability of FNAC, achieving an overall accuracy of 96.05% (with 62 out of 65 cases agreeing between FNAC and histopathology). This result is consistent with earlier studies by Altavilla et al. (92.86% accuracy) and strengthens FNAC's role as an important diagnostic method for thyroid enlargements. (11) Nevertheless, the research uncovered three inconsistent instances where FNAC results differed from histopathological observations:

One instance initially identified as a colloid nodule through FNAC was subsequently validated as papillary carcinoma upon histopathological examination. Two instances of follicular lesions of uncertain significance were ultimately recognized as follicular carcinoma. These inconsistencies underscore a significant drawback of FNAC - its sporadic failure to differentiate between benign and malignant conditions, especially in instances with similar cytological characteristics. The false-negative situation (colloid nodule misidentified as papillary carcinoma) is particularly worrisome since it might result in postponed treatment of a cancerous condition.

Among malignant cases, papillary carcinoma emerged as the predominant type (71.4%), followed by follicular carcinoma (28.6%). This distribution pattern is consistent with the typical distribution of thyroid malignancies reported in the literature. The study also noted a low false-negative rate in malignant cases, which is similar to Grant et al.'s reported rate of 0.7%.

CONCLUSION :

Fine-needle aspiration cytology (FNAC) stands out as a straightforward, safe, and economical diagnostic tool for investigating thyroid diseases, offering high accuracy and specificity in its assessments. Its practicality and affordability make it particularly advantageous in healthcare settings of developing nations like India, where access to advanced diagnostic technologies may be limited.

However, despite its overall reliability, FNAC results can occasionally be inconclusive or suspicious, presenting a challenge in clinical decision-making. When faced with such uncertainties, clinicians often resort to surgical resection and biopsy to obtain definitive pathological findings. This approach not only helps confirm diagnoses but also guides appropriate treatment strategies, especially in cases where thyroid nodules are suspected of harboring malignancies.

In essence, while FNAC serves as a valuable initial step in the diagnostic pathway for thyroid swellings, its limitations in certain scenarios necessitate a multidisciplinary approach involving surgical intervention to ensure comprehensive patient care and management.

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