

ORIGINAL RESEARCH

Study of Evaluation of Thyroid Nodules in Patients with Fine-Needle Aspiration Biopsy at a Tertiary Care Hospital

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ABSTRACT

Background: This study was conducted for the Evaluation of Thyroid Nodules in Patients with Fine-Needle Aspiration Biopsy. **Material and Methods:** A total of 100 subjects were included in this study. An assessment was conducted on the age, gender, thyroid FNA cytology, operation type, and histopathology of all the patients. Subjects over 16 years of age took part in the study. Statistical analysis was performed using SPSS software. **Results:** The pathology results revealed that adenomatous nodular hyperplasia was the predominant disease, accounting for 53% (n=53) of cases. Papillary carcinoma was occurred in 5% (n=5) of cases. Adenomatous nodule, follicular adenoma, follicular variant of papillary carcinoma, and follicular carcinoma accounted for 12% (n=12), 24% (n=24), 1% (n=1), and 1% (n=1) of cases, respectively. While 89% of the patients had a benign diagnosis, 9% were classified as suspicious, and 2% were deemed malignant in the FNAB procedure. Out of 9 cases found to be malignant on FNAB, histopathology diagnosis confirmed malignancy in 7 cases. Out of 89 cases confirmed to be benign on FNAC, histopathology confirmed presence of benign pathology in all the 89 cases. **Conclusion:** Ultimately, this study underscored the significance of FNA findings and their role in guiding surgical decision-making. It emphasized that the likelihood of malignancy in the final histopathology report after surgery is greater, particularly when worrisome FNAC results are present.

Keywords: Thyroid, nodule, FNAC

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INTRODUCTION

Thyroid nodules are clinically common endocrine pathologies that most frequently require surgical intervention. The incidence of thyroid nodules has increased in the last 30 years owing to the widespread use of imaging methods and the incidental detection of small thyroid nodules.^{1,2} Thyroid nodules are found in almost half of the population, and their incidence increases with age. Incidental thyroid nodules are seen in more than 20% of chest CT scans and in almost 20% of CT and MRI scans. The increase in thyroid nodule detection rates over the last 30 years may be related to these incidental cases. Thyroid fine-needle aspiration biopsy (FNAB) is the most accurate, reliable, and cost-effective test to evaluate thyroid nodules. FNAB has a long history of clinical practice in diagnosing thyroid nodules. The diagnostic criteria

allow follow-up and treatment options after FNAB to be clarified. As the diagnosis of thyroid nodules increases, the frequency of diagnosis of thyroid carcinoma also increases. The primary goal is differentiating between FNAB and pre-operative, benign, or malignant nodules.^{2,3}

The diagnosis of thyroid nodules by needle biopsy was first described by Martin and Ellis in 1930, who used an 18-gauge-needle aspiration technique. Subsequently, cutting needle biopsy with Silverman or Tru-Cut needles was used for tissue examination. None of these techniques gained wide acceptance because of fear of malignant implants in the needle track, false-negative results, and serious complications. However, Scandinavian investigators introduced small-needle aspiration biopsy of the thyroid in the 1960s, and this technique came into

widespread use in North America in the 1980s.³
⁴Hence, this study was conducted for the Evaluation of Thyroid Nodules in Patients with Fine-Needle Aspiration Biopsy.

MATERIAL AND METHODS

The study was conducted in Department of Surgery and Department of Pathology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Sawangi, Maharashtra, Meghe, Wardha (India) for the Evaluation of Thyroid Nodules in Patients with Fine-Needle Aspiration Biopsy. A total of 100 subjects were included in this study. Only those subjects were enrolled which underwent thyroid FNAB followed by thyroid surgery. All ultrasonographic examinations for the thyroid pathologies and simultaneous thyroid FNAB procedures were carried out very carefully. Following the FNAB findings, all the patients underwent surgical treatment and obtained specimens were sent for histopathological analysis. Histopathological evaluation was classified as benign and malignant. Correlation of FNAB findings was done with

histopathological diagnosis. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software.

RESULTS

A total of 100 patients who were admitted were enrolled. 60 subjects were females while 40 were males. The pathology results revealed that adenomatous nodular hyperplasia was the predominant disease, accounting for 53% (n=53) of cases. Papillary carcinoma was occurred in 5% (n=5) of cases. Adenomatous nodule, follicular adenoma, follicular variant of papillary carcinoma, and follicular carcinoma accounted for 12% (n=12), 24% (n=24), 1% (n=1), and 1% (n=1) of cases, respectively. While 89% of the patients had a benign diagnosis, 9% were classified as suspicious, and 2% were deemed malignant in the FNAB procedure. Out of 9 cases found to be malignant on FNAB, histopathology diagnosis confirmed malignancy in 7 cases. Out of 89 cases confirmed to be benign on FNAB, histopathology confirmed presence of benign pathology in all the 89 cases.

Table 1: Gender-wise distribution of subjects.

Gender	Number of subjects	Percentage
Males	40	40%
Females	60	60%
Total	100	100%

Table 2: FNAC findings

FNAC findings	Number	Percentage
Benign	89	89
Malignant	9	9
Unclear	2	2
Total	100	100

Table 3: Histopathological features.

Pathology	Number of subjects
Adenomatous nodular hyperplasia	53
Papillary carcinoma	5
Adenomatous nodule	12
Follicular adenoma	24
Follicular variant of papillary carcinoma	01
Follicular carcinoma	01
Other benign pathologies	04

Table 4: Corelation of FNAB and histopathological findings.

FNAB	Histopathology		
	Benign	Malignant	Total
Benign	89	0	89
Malignant	2	7	9
Unclear	2	0	2
Total	93	7	100

DISCUSSION

In recent times, the incidence of thyroid cancer has risen, with 10-15% of thyroid nodules being diagnosed with this pathology. FNAB is currently

employed in evaluating thyroid nodules which harbor malignancy. Fine-needle aspiration cytology is of pivotal diagnostic importance for clinicians in evaluating thyroid nodules and aids in preventing

unindicated thyroid surgeries. Also, when combined with the Bethesda system for reporting thyroid cytopathology (TBSRTC), FNAB provides a more robust, reliable, and cost-effective diagnostic outcome.⁵⁻⁹ The primary goal of performing an FNA of a thyroid nodule is to diagnose and/or exclude a malignant thyroid nodule. Ultrasound-guided FNA is imperative in directing the management of thyroid nodules, allowing for prompt diagnosis and treatment of thyroid malignancies. Additionally, the identification of benign thyroid nodules helps avoid unnecessary surgery and helps guide treatment and reduce the cost of care.¹⁰ Papillary thyroid cancer rates have been gradually increasing in incidence.¹¹ Papillary and follicular cancers are considered differentiated malignancies and are treated with total or partial thyroidectomy.¹² In particular, identifying papillary thyroid cancer is especially important due to its relatively good prognosis, with mortality rate, which have been reported as low as 2%.¹³ Hence, this study was conducted for the Evaluation of Thyroid Nodules in Patients With Fine-Needle Aspiration Biopsy.

In this study, the pathology results revealed that adenomatous nodular hyperplasia was the predominant disease, accounting for 53% (n=53) of cases. Papillary carcinoma was occurred in 5% (n=5) of cases. Adenomatous nodule, follicular adenoma, follicular variant of papillary carcinoma, and follicular carcinoma accounted for 12% (n=12), 24% (n=24), 1% (n=1), and 1% (n=1) of cases, respectively. While 89% of the patients had a benign diagnosis, 9% were classified as suspicious, and 2% were deemed malignant in the FNAC procedure. Out of 9 cases found to be malignant on FNAB, histopathology diagnosis confirmed malignancy in 7 cases. Out of 89 cases confirmed to be benign on FNAB, histopathology confirmed presence of benign pathology in all the 89 cases. In the study conducted by Turkkan E et al¹⁴, it was aimed to elucidate thyroid FNAB to understand how suspicious cases predict malignancy. Within this research's scope, 411 patients over 16 years old who were evaluated in Izmir Katip Celebi University, Ataturk Training and Research Hospital Internal Medicine (Izmir, Turkey) outpatient clinic for thyroid nodules between 2018 and 2022 and underwent thyroid FNAB followed by thyroid surgery were analyzed retrospectively. The age, gender, thyroid FNAB, operation type, and histopathology of all the patients were reviewed. Individuals with a history of head and neck cancer were excluded from the analysis. According to the FNAB results, the rate of being diagnosed with malignancy (positive predictive value (PPV)) was 93.9%, and the rate of being diagnosed as benign (negative predictive value (NPV)) was 85.8% for the individuals initially diagnosed as benign. Although FNAB remains the most important diagnostic tool to identify benign cases with a high accuracy rate, the operation decision is not clear in suspicious atypia of undetermined

significance/follicular lesions of undetermined significance (AUS/FLUS) cytology findings.¹⁴ Ceyhan Ugurluoglu et al performed in 1096 patients with thyroid nodules in the Medical School of Selcuk University between January 2009 and July 2014. Patients consisted of 919 women and 177 men between 12 and 87 years of age. Evaluated via BSRTC, the results were classified as unsatisfactory, benign, atypia (or follicular lesions) of undetermined significance (AUS), follicular neoplasm or lesions suspicious for follicular neoplasm (FN), suspected malignant and malignant. After FNAB, 183 patients were operated and evaluated histopathologically. Histological malignancy rates of the categories were as follows: 16% (5), 15% (6) 14% (1) 60% (9), 72% (18) and 97% (63), respectively.¹⁵

CONCLUSION

Ultimately, this study underscored the significance of FNA findings and their role in guiding surgical decision-making. It emphasized that the likelihood of malignancy in the final histopathology report after surgery is greater, particularly when worrisome FNAB results are present.

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