

Making Decisions in Thyroid Surgeries: The Crossroad**Laghvi Kothari¹, Pranjal Agarwal², Kanishk Mehta³**¹MBBS III Professional Part-1, American International Institute of Medical Sciences, Udaipur, Rajasthan²MBBS III Professional Part-1, American International Institute of Medical Sciences, Udaipur, Rajasthan³Associate Professor, Department of Otorhinolaryngology and Head Neck Surgery, American International Institute of Medical Sciences, Udaipur, Rajasthan

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Corresponding author: Dr. Kanishk Mehta

Conflict of interest: Nil

Abstract:**Background:** Thyroid lesions are one of the most common endocrine lesions that we encounter in today's modern practice. Due to its high prevalence it has become really important that we use as accurate modalities as we possibly can to provide the patients with better care.**Aim:** (1) to assess the efficacy of Fine Needle Aspiration Cytology (FNAC) in diagnosing thyroid diseases preoperatively, (2) to enumerate the conditions where FNAC poses a challenge and (3) to establish the role of USG-guided FNAC.**Method:** This is a retrospective study carried out from July 2022 to August 2022 where 93 patients who underwent thyroid surgery at our institute were included. Preoperative FNAC and postoperative HPR were correlated.**Results:** 26% discrepancy between the cytology and histopathology was reported. The major misdiagnosed cases were malignant, followed by inflammatory conditions.**Keywords:** Thyroid, FNAC, Histopathology.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Thyroid, a pivotal endocrine gland, plays central role in the body's metabolism, growth, maturation and also has an important role in controlling the heart rate and cardiac output. Thus thyroid abnormalities like thyroiditis, thyroid nodule, goiter and any malignancy must be diagnosed and managed as early as possible.

Thyroid has a broad range of pathological entities from benign to malignant tumors. Globally and notably in India, thyroid disorders are very common nowadays due to low consumption of iodine. It is very important for the surgeon or the treating clinician to be able to diagnose the thyroid condition as accurately as possible so as to avoid any unwanted medical or surgical treatment provided to the patient.

In India, currently FNAC is the most widely used preoperative diagnostic entity and it is being trusted upon by many surgeons to plan their surgeries. But the role of FNAC in thyroid disorders has been questioned since a long time.

In absence of any alternative effective diagnostic tool, the reliance on FNAC is undisputable. Keeping this in mind, we conducted a study with the aim [1] to assess the efficacy of Fine Needle

Aspiration Cytology (FNAC) in diagnosing thyroid diseases preoperatively, [2] to enumerate the conditions where FNAC poses a challenge and [3] to establish the role of USG guided FNAC.

Material and Methods

This is a retrospective, analytical, single hospital based study done from the period of July 2022 to August 2023 in the Department of ENT& HNS, American International Institute of Medical Sciences, Udaipur, and Rajasthan. A total of 93 patients were taken up for the study that underwent thyroid surgeries in the department.

All thyroid lesions irrespective of age and sex were referred for cytological study from the ENT OPD and only those who underwent surgery and their histopathological reports were available, were included in this study.

The patients who came with the thyroid lesions but refused to undergo FNAC examination or those who didn't undergo any surgery for the same were excluded from this study. Fine Needle Aspiration Cytology (FNAC), in our institute is performed under aseptic precautions using 23 gauge needles,

slides were prepared, and air dried was subjected for detailed cytological examination.

The cases were then correlated histopathologically and appropriate statistical tests were applied to analyze our results.

Results

In our study of 93 patients, majority of the cases belonged to the age group of 21-40 years followed by 41-60 years. The least number of cases were above 81 years of age. The gender preponderance was high in females as the ratio of female to male was 2.57:1.

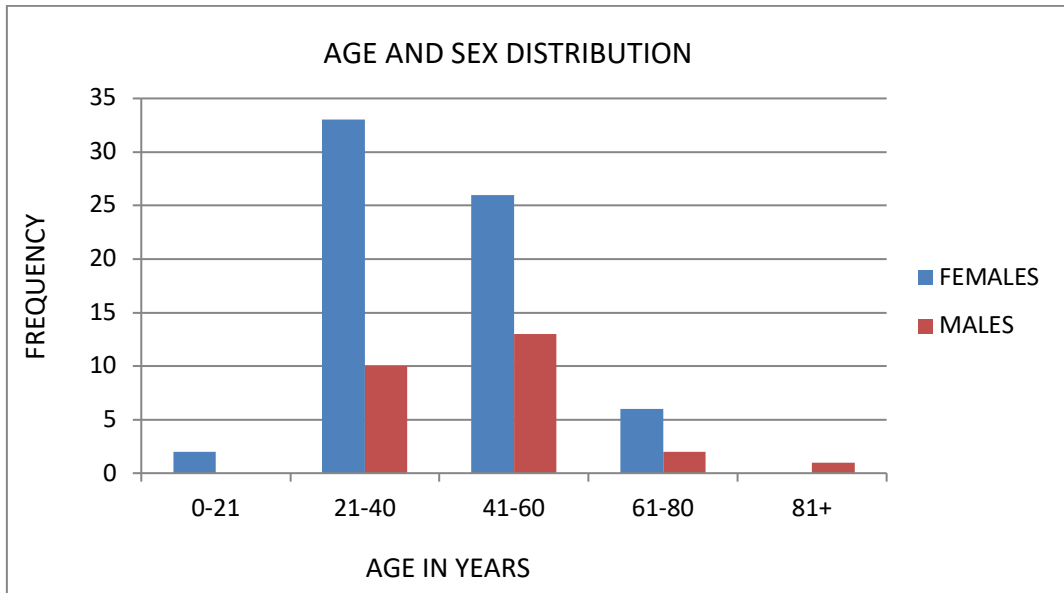


Figure 1: Age and Sex Distribution of the thyroid patients (N=93)

These patients who majorly presented with neck swelling were posted for surgery. Preoperative FNAC was performed on the OPD basis.

According to Bethesda category, maximum cases belonged to category II and least came out to be of categories III and VI. All the 93 patients underwent surgery at our institute, and it was observed that there were 67 patients who needed hemi-

thyroidectomy whereas 26 who needed total thyroidectomy. The incidence of right sided hemithyroidectomy was higher.

When we compared the preoperative FNAC with the postoperative histopathology reports, it was conferred that 24 out of all the cases were not correlated cyto-histopathologically, i.e. 26% of the total cases.

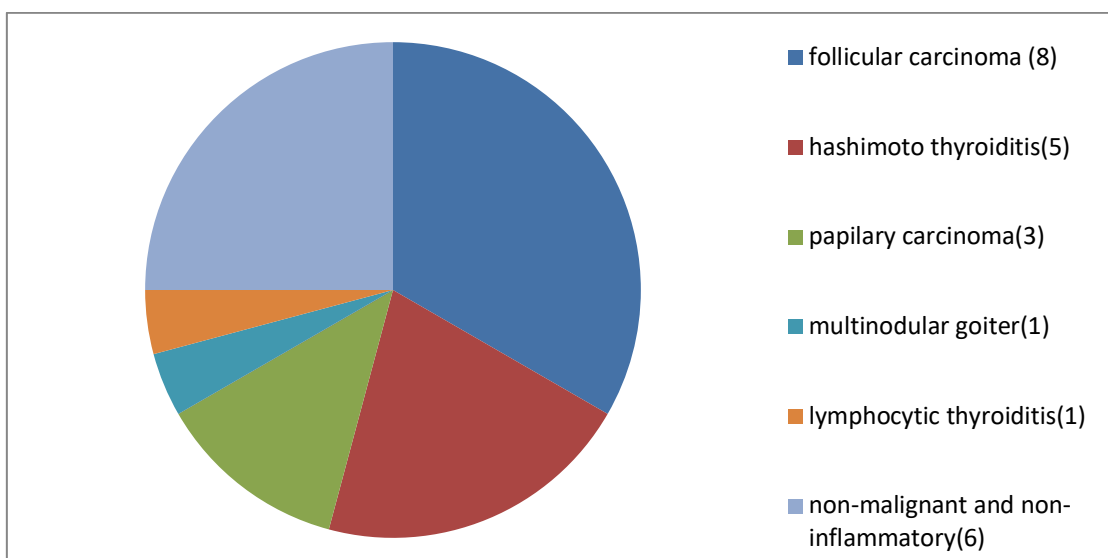


Figure 2: Chart depicting distribution of cases with no Histopathological correlation

It is also observed that the majority of the whole sample had the final diagnosis of colloid goiter, 34.4%. There are a total of 21 malignant cases and 72 benign cases. Out of all the malignant cases follicular carcinoma has the highest prevalence, 76.19% of 21 malignant cases. Cyto-histopathological similarities were not seen in 11 of the 21 malignant cases and 13 of the 72 benign

cases, there are 13 inflammatory thyroid lesions out of the total 93 cases and 6 cases were misdiagnosed by FNAC. When the data regarding the correlation between preoperative FNAC and postoperative histopathology in case of malignancy was analysed by the statistician it was conferred that the cyto-histopathological dissimilarity in 11 out of 21 cases is significant with the p-value of 0.003.

Table 1: Histopathological and Cytological diagnosis of all the patients (N=93)

No. of Patients	Final Histopathological Diagnosis	Cytological Diagnosis (Frequency)
16	Follicular Carcinoma	Follicular Carcinoma (8) Colloid Goiter (5) Follicular Neoplasm (2) Hyperplastic Nodule (1)
8	Hashimoto Thyroiditis	Hashimoto Thyroiditis (3) Lymphocytic Thyroiditis (2) Reidl's Thyroiditis (1) Follicular Neoplasia (1) Benign Thyroid Nodule (1)
5	Papillary Carcinoma	Papillary Carcinoma (2) Follicular Neoplasm (1) Bethesda Category 4 (1) Colloid Goiter (1)
32	Colloid Goiter	Colloid Goiter (30) Hyperplastic Nodule (1) Benign Thyroid Nodule (1)
20	Nodular Goiter	Nodular Goiter (18) Colloid Cyst (1) Follicular Neoplasm (1)
3	Lymphocytic Thyroiditis	Lymphocytic Thyroiditis (2) Nodular Goiter (1)
5	Adenomatoid Nodule	Adenomatoid Nodule (4) Colloid Goiter (1)
3	Multinodular Goiter	Multinodular Goiter (2) Benign Follicular Nodule (1)
1	Diffuse Thyroid Hyperplasia	Diffuse Thyroid Hyperplasia (1)

Table 2: Count of correlated and non-correlated cases

Diagnosis	Correlation Present	No Correlation Present	Total
Benign	59	13	72
Malignant	10	11	21
Total	69	24	93

Discussion

Thyroid is an important and active endocrine gland in the human body and thus it undergoes many physiological and pathological changes on the daily basis. The swellings of this gland are very commonly encountered by current medical practitioners which makes it really important that we diagnose the condition correctly and treat it as effectively as possible. Most of the thyroid swellings are posted for surgeries and it is necessary to preoperatively be able to analyze the condition as accurately as possible, so as to plan the surgery and future treatment accordingly. ENT surgeons frequently come across such cases where the postoperative histopathological diagnosis is entirely different from the preoperative cytological

reports. This may vary from centre to centre based on the limitations of the test, procedural bias and expertise of the reporting Pathologist. Such unexpected situations often pose an unwanted hindrance for the further treatment of the patients.

In this present study of 93 patients, majority of the patients belonged to the age between 21-40 years followed by 41-60 years, which was in accordance to other studies as well [1,2]. In our study there was female preponderance as the ratio of females, presenting with thyroid problems, to males was 2.57:1. This increased shift towards females could be due to the increased hormonal changes going on in their bodies during pregnancy or after menopause; however there could be many more possibilities. However, in our centre, the bulk of

male patients presenting with goiters was high, reducing the gender ratio. This higher incidence of thyroid problems among males in our geographical area could be possible due to various environmental conditions and cultural practices prevalent here.

The patients after cytological examination underwent surgery, and it was noted that out of the total 93 patients 67 patients had hemithyroidectomy (72.04%) and rest 26 had total thyroidectomy (27.9%). It was also noted that majority of the hemithyroidectomy were right sided. Ashwini et al. [3] observed that out of their total 253 cases, 134 were hemithyroidectomy, 108 were hemithyroidectomy combined with subtotal contralateral resection and 11 total thyroidectomy. When the postoperative histopathology was studied, we were able to infer that 35.48% of our patients had colloid goiter, 21.5% were malignant and 11.82% had thyroiditis, similar to E Gurkan Dumlu[6]; 36.6% of total cases were of colloid goiter. This varied from Pruthvi D. et al. [5] as they observed 58.3% colloid goiter, 33.3% thyroiditis and only 1.6% of malignant cases.

On comparing the preoperative cytology reports with postoperative histopathological reports, there was correlation seen between them in 69 of the total cases. This means that in 69 patients the preoperative FNAC and final HPR was same, which makes the diagnostic accuracy of FNAC 74.41%, different from 95.71% observed by Parampreet et al [10]. Majority of these patients had the diagnosis of colloid goiter, 90.90% cases had cytohistopathology concordance, which was almost similar to Jain S. et al.[4] (93.1%). While in 24 patients the FNAC and HPR did not tally. This is a statistically significant difference as the variation in preoperative and post-operative reports could have grave impact on treatment planning and outcomes. And when we observed these 24 cases, 11 were malignant and 6 were inflammatory in nature according the final histopathology reports. 8 of these malignant cases were of follicular carcinoma and 3 of papillary carcinoma.

We were able to deduce that out of 21 total malignant cases, correlation was maintained in only 10 and these numbers vary largely from Usha M. et al.[7] who was able to get the cytohistopathological correlation in 18 out of 21 malignant cases. This discrepancy between the cytology and histopathology could be due to multiple reasons viz site of aspiration, technique of aspiration and the pathologist's interpretation. For instance, in case of Papillary carcinoma, when a thyroid swelling is aspirated from the center then there could be cystic degeneration, reporting it to be a cystic lesion or there may be synchronous pathologies at the same time leading to misinterpretation.

Therefore it is really important to take samples for FNAC sample from all representative sites possible. Also it should be regular practice to get radiologically guided FNAC done so that better samples could be taken up for study, which was also suggested by various other studies [8,9] .

Similarly same cytological smear could be interpreted differently by different pathologists in cases where there are multiple features presented. In such grey areas the FNAC could be repeated and studied again also there could be a panel of at least 2 pathologists and treating clinician who can come to a better conclusion with unbiased observations and analysis. This may seem time consuming but will definitely reduce the bulk to incomplete or wrongly treated cases.

The current study also elucidates that the major bulk of non-correlated cases were either malignant or inflammatory in nature. In cases of suspicion, Radioactive Iodine (I-131) uptake scan could also be considered as an aid for the surgeon. The limitations of FNAC in detecting capsular invasion may be overcome by added information given by I-131 scan.

Conclusion

When studied for the correlation between preoperative cytological and postoperative histopathological reports of the patients, there is statistically significant error of correlation. This may put the surgeon at the crossroad of decision making and put patient's body at risk. To minimize this error we propose the use of USG guided FNAC and aspiration from all representative sites (solid and cystic) as a standard protocol for all routine goiter assessments. This may increase the initial cost and time of testing but reduces the cost of re-surgery, wrongly or incompletely treated thyroids, mental and physical stress to the patient. Also, as the load of error is more common in inflammatory and malignant cases of thyroid, we also propose that wherever possible, I-131 scan may be done as it helps in differentiating benign Vs malignant nodules.

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