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FNAC AND HPE CORRELATION OF THYROID LESIONS IN THE DISTRICT OF KANCHIPURAM

Pathology

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ABSTRACT

The main indication for fine-needle aspiration (FNA) of the thyroid is a thyroid nodule. Solitary thyroid nodule is defined clinically as the localized thyroid enlargement. The main aim of FNAC is to identify nodules that require surgery. The prevalence of thyroid nodules ranges from 4% to10% in the general adult population and from 0.2% to 1.2% in children. FNA has been shown to be the safest and most accurate of diagnostic tools in thyroid lesions with a sensitivity as high as 93.4% and a specificity of 74.9%. FNAC is considered the gold standard diagnostic test in the evaluation of a thyroid nodule.

The present study is a retrospective study on 100 patients in Department of Pathology. The patients presented with primary complaints or incidental findings of neck swelling in the Department of Surgery and Department of ENT. FNAC was performed on these patients and only those thyroid swelling cases that underwent surgery were included in this study. After histopathologic study they were compared with preoperative FNAC report. Statistical analysis of neoplastic lesions showed sensitivity, specificity, positive predictive value, and negative predictive value of FNAC to be 67%, 94%, 84%, 100%, and 94%, respectively.vIn conclusion, FNAC is a very useful method for screening of thyroid lesions in third world countries with a very high specificity and sensitivity. The false negative cases can be attributed to technical errors in performing the procedure or the presence of small papillary microcarcinomas, which can be confirmed only after the surgical excision of the thyroid gland.

KEYWORDS

Thyroid lesions, comparison of FNAC and HPE

INTRODUCTION

The main indication for fine-needle aspiration (FNA) of the thyroid is a thyroid nodule. Thyroid nodule can be seen in a variety of pathologic entity, ranging from benign nodular colloid goiters to malignant lesions such as Papillary thyroid carcinoma or poorly differentiated carcinomas. Thyroid nodule is defined clinically as the localized thyroid enlargement, it can be solitary or multiple. The main aim of FNAC is to identify nodules that require surgery. The prevalence of thyroid nodules ranges from 4% to10% in the general adult population and from 0.2% to 1.2% in children [1] . FNA has been shown to be the safest and most accurate of diagnostic tools in thyroid lesions [2,3] with a sensitivity as high as 93.4% and a specificity of 74.9%. FNAC is considered the gold standard diagnostic test in the evaluation of a thyroid nodule. The thyroid nodules can present clinically as neck swelling, pain in the neck, neck discomfort or just an incidental finding during palpation of the neck or during the ultrasound examination of some unrelated neck lesion.The aspiration can be guided either by palpation or ultrasound. Ultrasound guided FNA is preferred in small nodules which are difficult to palpate and asirate or in nodules which are very vascular in nature. The benefits of palpation guidance are its reduced cost and efficient handling of the material aspirated. The limitation of FNAC includes false negative result and false positive results. The present study was done to correlate the FNAC findings with histopathology so that rate of unnecessary surgery in benign pathologies could be avoided.

AIM AND OBJECTIVES

Correlation between FNAC and histopathology of different types of thyroid swelling.

MATERIAL AND METHODS

The present study is a retrospective study on 100 patients in Department of Pathology, Meenakshi Medical College and Research Institute, Kanchipuram from the period of March, 2014 to March2017. The patients presented with primary complaints or incidental findings of neck swelling in the Department of Surgery and Department of ENT.

FNAC was performed on these patients and only those thyroid swelling cases that underwent surgery were included in this study. Both USG guided and palpation FNAC study are included in this study. HPE study was done by formalin fixation of the surgical sample, followed by routine tissue processing, paraffin embedded sections were made, followed by routine H & E staining. Ancillary studies like immunohistochemistry have been performed in selective cases, but have not been included in this study due to complexities that may arise. After histopathologic study they were compared with preoperative FNAC report. Patient with other neck swellings like lymph node lesions or other mesenchymal lesions and thyroid FNACs that were not followed up by surgery were not included in this study.

RESULTS

A total of 100 patients with thyroid nodule were identified. 20 (20%) were male and 80 (80%) were females. Age of the patients ranged from 11 to 65 years old, with mean age of 39.08. Duration of complaints ranged from 1 week to 2.5 years. FNAC results revealed 70 cases as Nodular colloid goiter with or without cystic degeneration, 4 cases as Papillary carcinoma thyroid, 16 cases as Hashimoto's thyroiditis, 8 cases as follicular neoplasm and 2 cases as Hurthle cell neoplasm. Comparison of FNAC and histopathologic findings were done. 60 cases were found to be as Nodular colloid goiter with or without cystic degeneration, 6 cases of Papillary carcinoma thyroid, 20 cases of Hashimoto's thyroiditis, 12 cases of Follicular adenoma and 2 cases as Hurthle cell adenoma.

Statistical analysis of neoplastic lesions showed sensitivity, specificity, positive predictive value, and negative predictive value of FNAC to be 67%, 94%, 84%, 100%, and 94%, respectively.

DISCUSSION

FNAC is a very useful and cost effective method for screening of thyroid lesions in third world countries with a very high specificity and sensitivity. Although FNAC results cannot and should not be used for a final diagnosis, it is a very useful way of communication between the clinician and the Pathologist. The benign cases do not warranty surgical intervention without other clinical indications such as compression of other vital neck structures and / or cosmetic malformations. However, FNACs cannot rule out the possibility of metastasized tumor masses until and unless the metastatic mass is detected by either the clinician or the Pathologist and subsequent FNAC or a tissue biopsy is performed. The false negative cases can be caused due to technical errors in performing the procedure. Technical errors occur more in untrained personnel, which can be eliminated by the presence of an experienced supervisor. False negative cases also can occur due to the presence of small papillary microcarcinomas which can be confirmed only after the surgical excision of the thyroid gland. In such selected cases where the presence of a carcinoma is suspected clinically, such patients should be followed up even if the FNAC shows benign lesions. Especially in a third world country like India, where majority of the patients find it difficult to afford quality

healthcare, FNAC of thyroid lesions should be considered as a gold standard examination due to its high specificity and sensitivity, also considering the low cost of this particular examination and efficiency by which it can be reported by a Pathologist.

In comparison to other studies, Mundasad et al.[4] had a sensitivity of 52.6 % and a specificity of 86.6 %, Bouvet et al.[5] found the sensitivity of 93.5 % and specificity of 75 %. Handa et al.[6] had a sensitivity of 97 % and a specificity of 100 %. Thus the findings of this study is in accordance with studies mentioned above.

CONCLUSION

Although its not difficult to diagnose thyroid nodules clinically, it is of utmost importance to decide the fate of the lesion which varies from observation to surgical removal of the organ. There have been numerous studies highlighting the fact that FNAC of thyroid nodules do give a very accurate diagnosis of thyroid nodules, with a very high sensistivity and specificity. The FNAC results in this study are compared with HPE report. Statistical analysis of neoplastic lesions studided here showed sensitivity, specificity, positive predictive value, and negative predictive value of FNAC to be 67%, 94%, 84%, 100%, and 94%, respectively.

Table 1 : Distribution of the patients according to the age group

Age group of the patient	Number of patients (n =100)
10– 19 years	4
20 – 29 years	20
30 – 39 years	32
40– 49 years	28
50– 59 years	8
>60 years	8

Total number of patients = 100.

Most of the patients belonged to the fourth decade of life, where the frequency of occurrence of thyroid lesions appear to be maximum in this particular district. Out of the 100 patients studied, 32 patients belonged to the age group of 30 – 39 years, the least number of patients presented belonged to the 2nd decade of life (10 – 19 years).

Table 2 : Distribution of the patients according to the presenting complaints and the duration of complaints

Presenting complaints	Duration of complaints
Neck swelling (n = 76)	< 1 month (n = 7)
Neck pain (n = 12)	1 -12 months (n = 14)
Neck discomfort (n = 8)	1 – 2 years (n = 23)
Incidental (n = 4)	>2 years (n = 56)

Total number of patients = 100.

Neck swelling was the chief complaint of the patients (n = 76), 12 patients presented predominantly with neck pain (n = 12), 8 patients presented with discomfort in the neck (n = 8) and incidental finding in 4 patients (n = 4).

The duration of complaints of thyroid nodules was found to be more than 2 years in 56 patients (n = 56), from 1 to 2 years in 23 cases (n = 23), 1 to 12 months in 14 cases (n = 14) and less than 1 month in 7 cases (n = 7).

Table 3: Non neoplastic lesions diagnosed in FNAC (Nodular colloid goiter with / without cystic degeneration) and their histopathologic comparison. Total number of patients = 70.

Histopathological report	Number of patient	Remarks
Nodular colloid goiter with / without cystic degeneration	60	True negative
Papillary carcinoma thyroid	2	False negative
Hashimoto's thyroiditis	6	True negative
Follicular adenoma	2	False negative

This table was prepared after comparison of every FNAC result with its HPE counterpart and the following data was revealed. 60 cases (n = 60) reported to be having Nodular colloid goiter with / without cystic degeneration in HPE report were diagnosed as not having any neoplasm in FNAC, thus presenting as true negative. 2 cases (n = 2) reported to be Papillary thyroid carcinoma (PTC) in HPE were actually reported as negative for malignancy or neoplasm in FNAC, thus presenting false negative cases. Likewise, 2 cases (n = 2) which was was reported as follicular adenoma in HPE was misdiagnosed as negative for follicular neoplasm in FNAC, thus being counted as false negative. 6 cases (n = 6) were reported as Hashimoto's thyroiditis in HPE, which was reorted as negative for neoplasm in FNAC, thus presenting as true negative.

Table 4: Summary of false positive and false negative results

FNAC	HPE comparison
False positive 1) Follicular neoplasm	Nodular colloid goiter Hashimoto's thyroiditis
False negative 1) Nodular colloid goiter	Papillary thyroid carcinoma (PTC)

In the false positive cases, cases diagnosed as Follicular neoplasm in the FNAC reports, it was found to be Nodular colloid goiter with / without cystic degeneration and Hashimoto's thyroiditis in HPE reports. Subsequently in false negative cases, lesions diagnosed as Nodular colloid goiter with / without cystic degeneration in FNAC, was found to be having Papillary thyroid carcinoma (PTC) in HPE. This might be explained by the presence of the micropapillary variant of Papillary thyroid carcinoma, which can be frequently missed in FNAC examinations and thus warranty a clinical follow up even if the FNAC report cites the lesion to be a benign one. But this is infrequent, giving a very good positive predictive value (PPV) of FNAC lesions.

Table 5: Comparison of sensitivity and specificity of this study with previous ones

	Mundasad et al.[4]	Bouvet et al.[5]	Handa et al.[6]	Present study
Sensitivity	52.6 %	93.5 %	97 %	67%
Specificity	86.6 %	75 %	100 %	94%

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