



FNAC Vs Histopathology in the Diagnosis of Thyroid Swellings

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Abstract

Background: *Fine Needle Aspiration Cytology (FNAC) is important for pre-operative and pre-treatment diagnosis of benign and malignant thyroid lesions, thus decreasing the incidence of unwanted surgeries. FNAC of thyroid swellings is a simple, rapid, patient friendly and inexpensive procedure, which can be repeated in cases of inadequate samples. It has the best predictive value of all currently available diagnostic procedures. Bloch et al had done a comparison study between FNAC and histopathology and then found that the accuracy and FNAC was 91.6%¹. Handa et al have a similar study in which FNAC revealed a sensitivity of 97%, specificity 100%, a Positive Predictive Value of 96% and a negative predictive value of 100%⁷.*

Materials and Methods: *The present study is a prospective study and was conducted on 100 patients in the Department of General surgery, Kanyakumari Government Medical college from January 2016 to December 2016. Various neck swellings presented to General Surgery department, were examined clinically after thorough history taking. They were subjected to FNAC and only those thyroid swelling cases admitted to indoor and subsequently underwent surgery were included in this study. After HP study they were compared with preoperative FNAC report. In all 100 cases, informed consent was taken prior to the surgery.*

Results: *Out of total 100 cases studied, 96 Cases were females & 4 cases were males. 53 patients (53%) had colloid goitre, 8 patients (8%) were suspicious for follicular neoplasms, 15 patients (15%) had Hashimotos and 11 patients (11%) had Papillary carcinoma, 10(10%) were Atypia of undetermined significance and inadequate. Cyto-histopathological correlation of 100 cases was done. Sensitivity and specificity of the study for colloid goiter, Hashimotos, papillary carcinomas & malignant neoplasm were 100%, 86.7% % and 81.8%, 66.67% respectively.*

Conclusion: *FNAC is a safe, simple, highly accurate, economical and universally accepted modality for evaluation of thyroid lesions. FNAC helps in avoiding unwanted surgeries in patients diagnosed to have a benign pathology based on cytology. Those that are grouped in the suspicious or indeterminate category on cytology include lesions of uncertainty that are finally confirmed on histopathology. However, histopathological analysis is still remaining essential to distinguish follicular adenoma from follicular carcinoma.*

Introduction

Among the endocrine organs, thyroid gland disorders are the most commonest in clinical practice. Fine-needle aspiration cytology (FNAC) plays a vital role in the evaluating patients with thyroid swellings. The vast majority of thyroid swellings are non-neoplastic lesions and only < 5% are malignant. Clinical features alone cannot distinguish between benign and malignant swellings. Thyroid cytology not only provides a definite diagnosis of malignancy but also the tumour type, thus enabling appropriate therapeutic surgery. Benign lesions can be managed conventionally. However, the incidence of thyroid malignancy is quite low and only 1 in 20 clinically identified swellings turn out to be malignant, thyroid FNAC helps in reducing the rate of surgery for benign thyroid diseases.

Aims & Objectives

To study the sensitivity and specificity of FNAC in palpable thyroid lesions with their histopathological correlation.

Material And Methods

The present study was a prospective and interventional type of study, the study was undertaken to study the cytology of the palpable thyroid lesions and compared them with histopathology to determine its diagnostic accuracy. All the patients were clinically

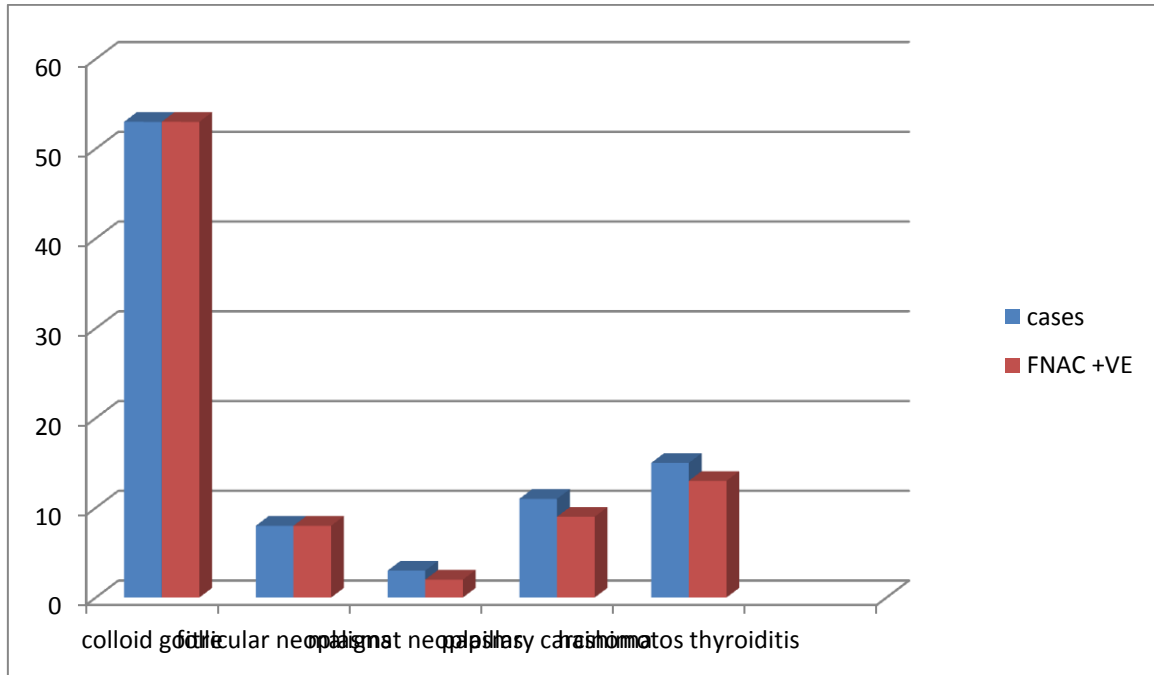
examined in detail and a careful palpation of the thyroid gland were done to judge precisely the location for aspiration. After brief explanation about the procedure to the patient, aspiration was done with the patient in supine or sitting position with extended neck, so as to make the thyroid swelling appear prominent. The material was obtained by using a 2.5 cm long, 23-25 gauge needle attached to a 10cc disposable syringe by applying mild suction. Multiple smears were prepared and equally divided into air dried and wet fixed smears. Wet fixed smears were immediately fixed in methanol taking precaution that the smears did not get air dried. These smears after fixation were stained with Hematoxylin and Eosin. The smears intended for Giemsa stain were quickly air dried and fixed with methanol and stained with Giemsa stain.

The cases were followed by cytology and histopathological reports received from the department of Pathology. Cytological diagnosis was correlated with histopathological diagnosis. Thus, the diagnostic accuracy, sensitivity and specificity, positive predictive value (PPV) and negative predictive value (NPV) of FNAC in diagnosing thyroid swellings were calculated.

Observation & Results

Distribution of individual thyroid lesions based on cytological study

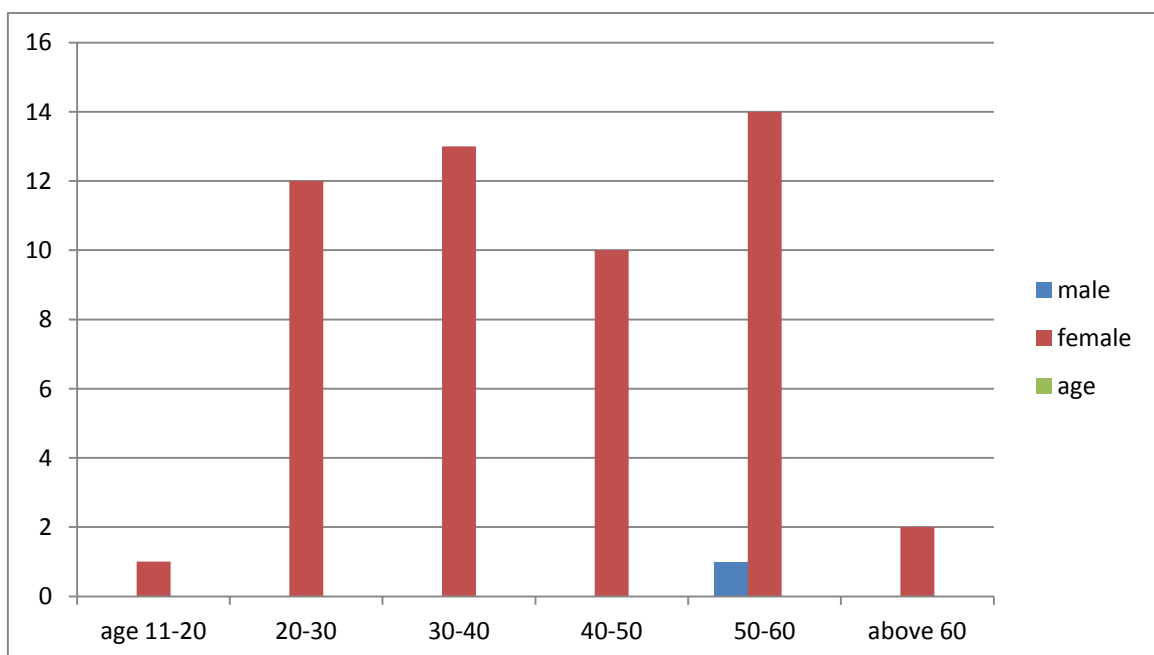
LESIONS	No of cases	positive FNAC
• Colloid goiter	53	53
• Follicular lesions	08	08
• Hashimoto's	15	13
• Papillary carcinoma	11	09
• Malignant neoplasms	03	02
• others	10	
• Total	100	



Among the 100 cases, 53 patients were diagnosed pre-operatively. Among 53 patients, 52 were females, 1 was male. All 53 patients with colloid goiter were positively co-related with their FNAC findings.

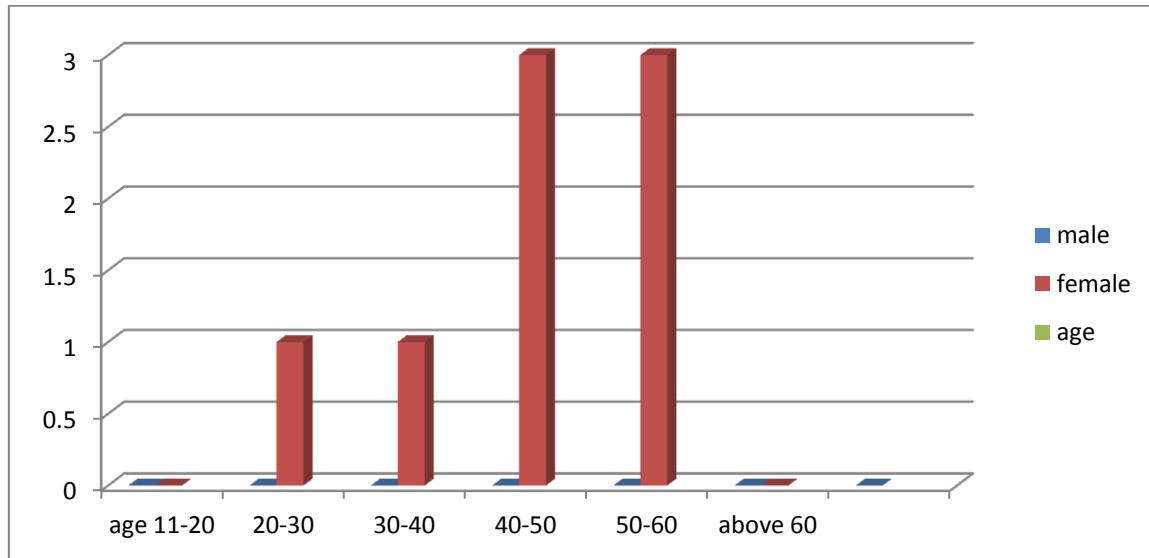
Age and sex distribution of the patients with colloid goiter:

Age group (years)	Male	Female	Total
11-20	0	1	01
21-30	0	12	12
31-40	0	13	13
41-50	0	10	10
51-60	1	14	15
>60	0	2	02



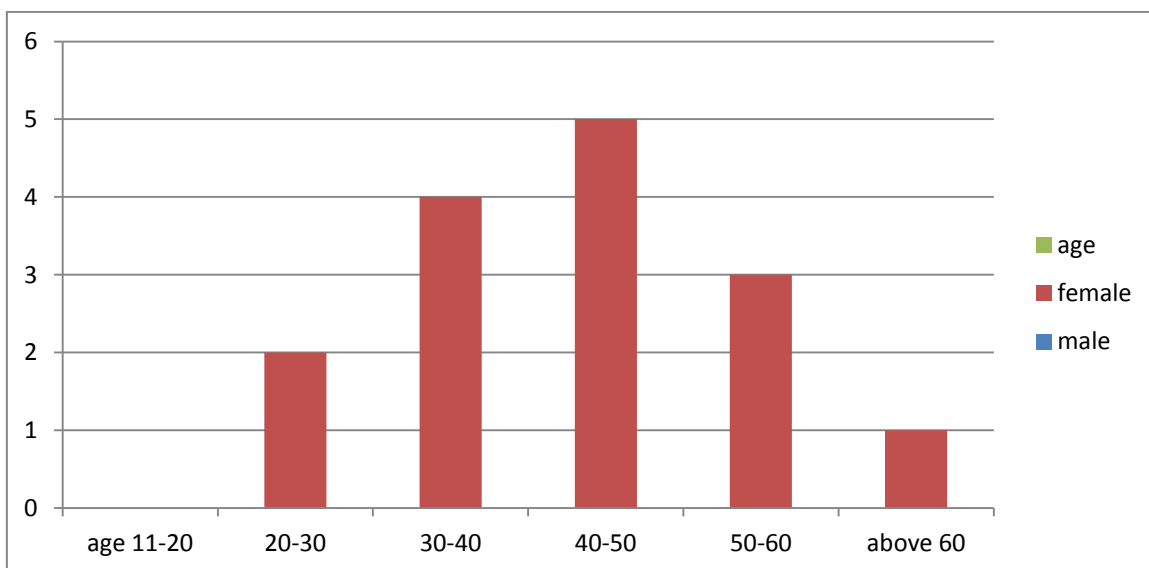
Age and sex distribution of the patients with FOLLICULAR ADENOMA. (FNAC – Follicular Neoplasm)

Age group (years)	Male	Female	Total
11-20	0	0	00
21-30	0	1	01
31-40	0	1	01
41-50	0	3	03
51-60	0	3	03
>60	0	0	00



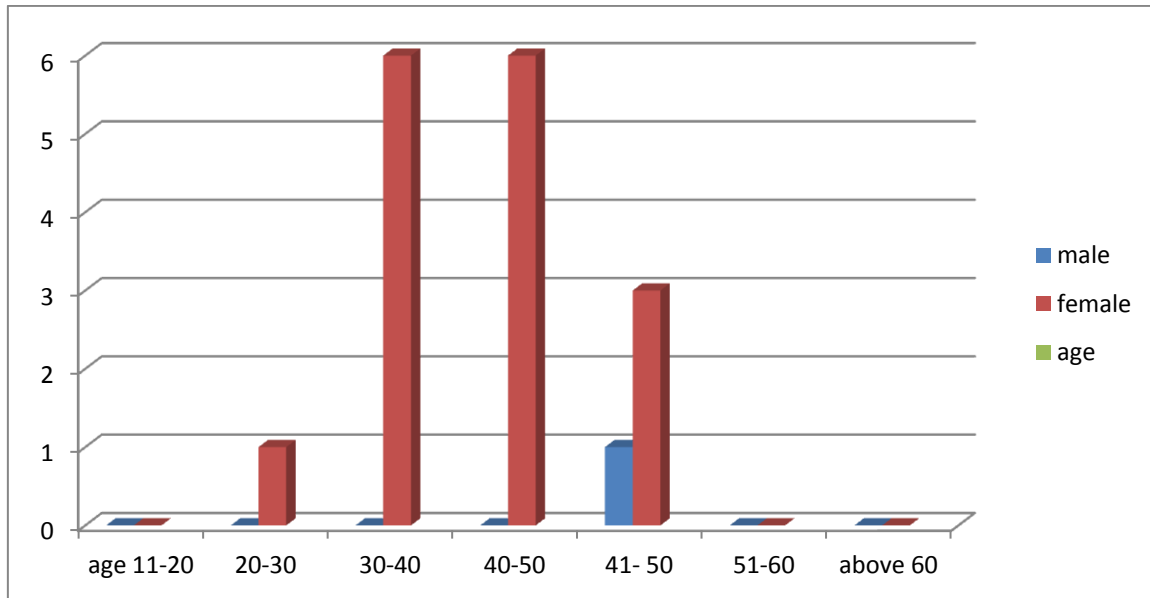
Age and sex distribution of the patients with HASHIMOTOS

Age group (years)	Male	Female	Total
11-20	0	0	00
21-30	0	2	02
31-40	0	4	04
41-50	0	5	05
51-60	0	3	03
>60	0	1	01



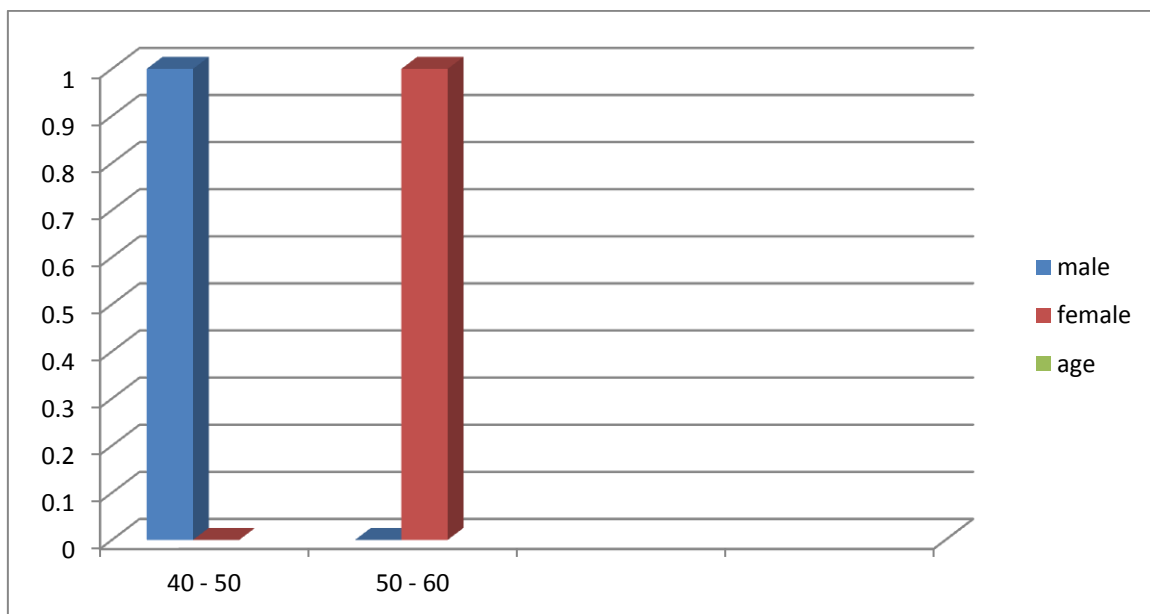
Age and sex distribution of the patients with PAPILLARY CARCINOMA

Age group (years)	Male	Female	Total
11-20	0	0	00
21-30	0	1	01
31-40	0	6	06
41-50	1	3	04
51-60	0	0	00
>60	0	0	00



Age and sex distribution of the patients with MEDULLARY CARCINOMA.

Age group (years)	Male	Female	Total
41-50	1	0	01
51-60	0	1	01



Discussion

In the present study, most of the patients are females (96%) with 21-50 years age patients affected more commonly (63%). Out of 100 cases histopathology was available in all cases and correlated with cytological diagnosis. In the present study, out of 100 cases, benign lesions were 77%, malignant lesions were 13% and 10% were suspicious lesions.

In the study done by Chandanwale et al², malignant lesions were 4% out of which 2.6% were papillary carcinoma. In the study done by Moosa et al⁶, malignant lesions were 7.9% out of which 6.8% were papillary carcinoma. In the present study, benign lesions constituted 68%, malignant lesions 14% out of which papillary carcinoma were 11% of cases.

Distribution of various cytological lesions in different series

	Chandanwale et al. 150 cases.	Moosa et al. 98 cases.	Present study. 100 cases.
Benign lesions.	77.6%	89.8%	77%
Malignant lesions	6.75%	8.16%	13%
Suspicious	13.65%	2.04%	10%

Distribution of results:

STUDY	Chandanwale et al.	Moosa et al	Present study
Sensitivity	90%	77.7%	85%
Specificity	100%	98.9%	100%

In our series detailed history was taken and clinical evaluation was done for every cases. All the 100 patients presented to us with a complain of swelling at thyroid region. Most of the patients were asymptomatic at the time of presentation. Other presenting features were matatastic cervical lymphadenopathy five (5.55%) out of 100 cases, two (2.22%) presented with dyspnoea (due to pressure by huge thyroid swelling) and two (2.22%) presented with change of voice (due to right vocal cord palsy). Regarding the duration of thyroid swelling, maximum thirty four (37.78%) out of 100 presented to us in our series with the duration of 1-2 years. Shortest duration of thyroid swelling was 8 months and longest duration was 12 years.

In general, Palpable thyroid nodules are present in approximately 4–7% of adults^{3,4} and are more common in females with a Female: Male ratio of 4.2:1⁽⁵⁾. In the present study also there was a female predominance. The lesions were common in females with the male: female ratio being 1: 24 and the mean age of the patients was 40.14 years.

Thyroid gland carcinoma accounts for less than 1% of all cancers and is responsible for 0.5% of all cancer-related deaths¹⁰. Early diagnosis of such cases is thus important for aiming at higher life expectancy especially since thyroid gland cancers have a low malignant potential and also have a slow progressive property. Majority of the clinically diagnosed palpable thyroid nodules are non-neoplastic. Multiple aspirations avoid missing a neoplastic focus. Every thyroid FNAC should be evaluated for adequacy of the smears. FNAC used together with other diagnostic modalities such as thyroid scanning, ultrasonography, thyroid hormone and antibody level measurements enhances the diagnostic accuracy of the technique. All the patients, tolerated the aspiration procedure and there were no complications. Among the non-neoplastic lesions, Benign follicular lesion (8%) and colloid goitre was commonly encountered (53%). Hashimoto's thyroiditis was diagnosed in 13 cases out of 15 cases.

Limitations

The major limitation of FNAC is its insensitivity in correctly diagnosing malignant follicular lesions. In addition; a proportion of cases cannot be evaluated because of paucity of material⁸.

Conclusions

FNAC exhibits an adequate diagnostic correlation with the final histopathological examination and enables a comparison of results between different institutions. Our results are consistent with those available in the literature. FNAC is an invaluable tool in the management of thyroid lesions with a high degree of accuracy. It is safe, simple, cost-effective procedure with absence of major complications and can be performed on out-patients with wide patient compliance. FNAC provides a more rapid and accurate diagnosis of thyroid lesions than any other combination of clinical laboratory tests. But, Histopathology is always required to confirm the diagnosis and for further management.

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