

Study of Role of Fine Needle Aspiration Cytology in Diagnosis of Thyroid Lesions



Medical Science

KEYWORDS : Fine needle aspiration cytology thyroid.

Dr Anil Vare	Dept. of Pathology, MGM Medical College, Aurangabad.
Dr Reena Vare	Dept. of ENT MGM Medical College, Aurangabad.
Dr Annju Thomas	Dept. of ENT MGM Medical college, Aurangabad.
Dr Irmeen Manzoor	Dept. of Pathology, MGM Medical College, Aurangabad.

ABSTRACT

AIMS: 1. To study cytomorphological features of palpable thyroid lesions by FNAC.

2. To correlate FNAC with histopathological diagnosis of all surgically removed thyroid lesions

3. To evaluate sensitivity and specificity of FNAC of thyroid lesions.

METHOD: This prospective study was carried out in the department of Pathology MGM Medical College and Hospital, Aurangabad, during the period of June 2011 to May 2013. The study comprises of 100 patients who presented with the swelling of thyroid which were referred from the Department of ENT of this institute.

RESULT: FNAC is a simple, reliable and cost effective technique which can be used to diagnose thyroid pathologies quite accurately. Till today FNAC is the mainstay in selecting patients for thyroid surgeries.

INTRODUCTION:

Fine needle aspiration is well established first line diagnostic tool for evaluation of palpable thyroid swellings. Currently this technique is practiced worldwide, the investigation of choice in thyroid and other palpable swellings of breast, salivary glands, soft tissue, lymph nodes and skin etc.

The technique is relatively painless, produces a speedy result and inexpensive. Its accuracy in many situations, when applied by experienced and well trained practitioners, can approach to that of histopathology in providing an unequivocal diagnosis. But aspiration cytology is not a substitute for conventional surgical histopathology, it should be regarded as an essential component of pre-operative/ pre-treatment investigation of pathological processes.

FNAC is a diagnostic tool in which cells are aspirated from a palpable swelling using syringe and fine needle. With this rapid diagnostic technique costly days in hospital can be saved, since a diagnosis can be obtained within minutes. The whole procedure including fixation and staining is quick and a report can be issued within hours. The immediate diagnosis relieves patient's anxiety and saves time. A definitive treatment can be planned in advance.

Thyroid lesions are common clinical finding and frequently encountered in surgical practice, the majority of them benign and 5-15 were malignant. It is difficult by clinical evaluation to distinguish malignant from benign lesions. Fine needle aspiration is a first diagnostic test and a gold standard technique used for differential diagnosis of these lesions and effective early and rapid screening tool for evaluation of thyroid lesion. The routine use of fine needle aspiration cytology in the assessment of thyroid nodules has reduced the number of patients subjected thyroidectomy.

FNAC bridges the gap between clinical evaluation and final surgical pathological diagnosis in majority of cases and helps to reduce unwarranted surgeries. As a result, the incidence of malignancy at thyroidectomy has increased from 5-10% to 30-50%.

MATERIAL AND METHODS:

This prospective study was carried out in the department of Pathology MGM Medical College and Hospital, Aurangabad, during the period of June 2011 to May 2013. The study comprises of 100 patients who presented with the history of thyroid which were

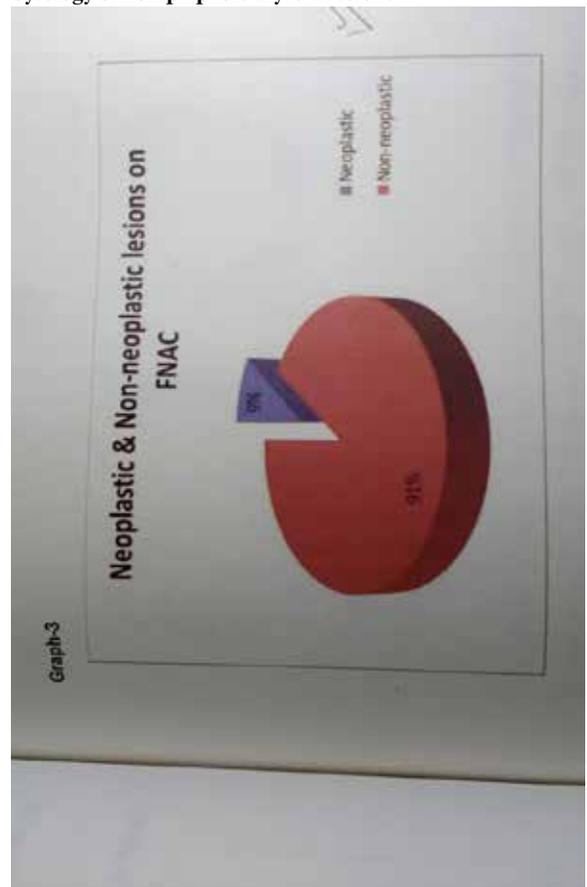
referred from the Department of ENT of this institute.

Inclusion criteria:

Fine needle aspiration of all patients, both male and female presenting with clinically palpable thyroid lesions and USG guided fine needle aspiration cytology of thyroid lesions.

Exclusion criteria:

Cytology of non-palpable thyroid lesions.



Congenital anomalies of thyroid.

All patients were clinically examined in detail according to the proforma and careful local examination of the thyroid gland was done to judge the location of swelling for doing the aspiration. A detail of the procedure was explained to the patient and written consent was taken.

Procedure was carried out in E.N.T. OPD by otorhinolaryngologist.

The procedure was explained to patient and consent was taken.

Patient was examined in lying down supine position.

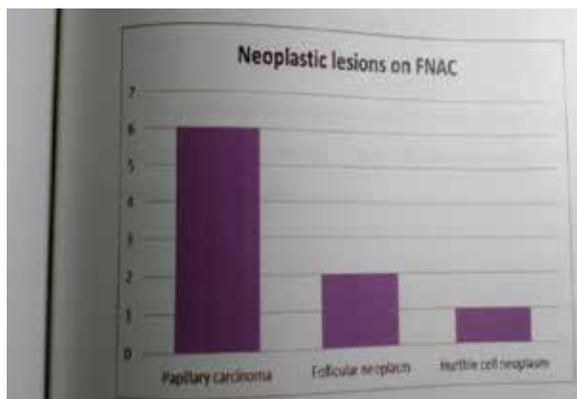
The neck was extended with a pillow under the shoulder so as to make the swelling of the thyroid appear prominent. Under aseptic precautions 23 gauge needle with syringe holder (comeco) was inserted into the lesion and to and fro movement performed quickly.

Under negative pressure material gets collected in the needle, after collection of material negative pressure was released needle with syringe holder removed, material spread over a clean slide and smears were prepared and stained with pap stain, H&E stain, giemsa stain.

RESULT:

The present study deals with the fine needle aspiration cytology (FNAC) of thyroid lesions and determination of the diagnostic accuracy of the aspiration cytology with the histopathological correlation. 100 FNACs were done out of which 70 cases underwent surgery subsequently and subjected to histopathological study.

Among the total thyroid aspirations, 91% constitutes non-neoplastic lesions and the remaining 9% were neoplastic lesions.



In our study sensitivity is 73.3%, specificity 94.4%, false positive rate of 2%, false negative rate of 8% and accuracy of 88.4%, the results are consistent with studies.

The sensitivity, specificity and accuracy of FNAC for malignancy

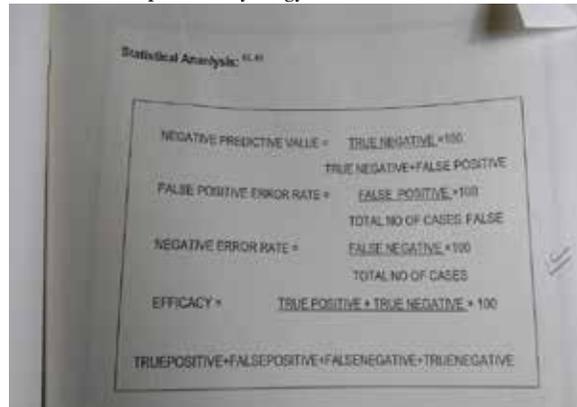
Table 7: Statistical Data of the present study

SENSITIVITY	77%
SPECIFICITY	98.3%
POSITIVE PREDICTIVE VALUE	87.5%
NEGATIVE PREDICTIVE VALUE	96.7%
FALSE POSITIVE ERROR RATE	1.4%
FALSE NEGATIVE ERROR RATE	2.8%
DIAGNOSTIC ACCURACY	95.7%

detection have eclipsed the diagnostic utility of other diagnostic methods and this procedure has assumed a dominant role in determining the managements of patients with thyroid lesions.

DISCUSSION:

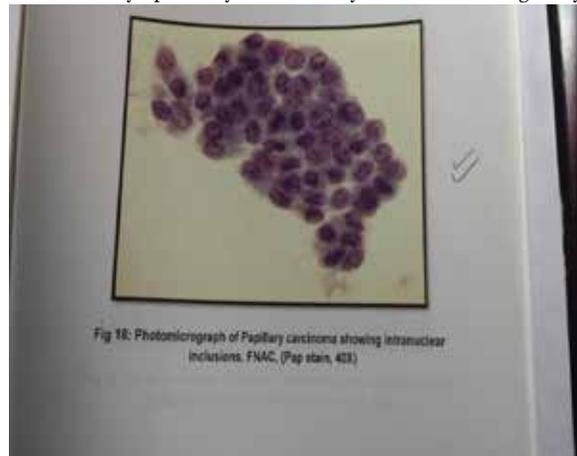
Fine needle aspiration cytology is well established first line



screening tool for evaluation of thyroid lesions. It helps in early detection and proper management of thyroid lesions. It bridges the gap between clinical evaluation and final surgical pathological diagnosis in major of cases and helps to reduce unwarranted surgeries.

Fine needle aspiration cytology is a safe, simple and inexpensive technique that has emerged as a valuable and popular adjunct in the diagnosis and management of various thyroid lesions. Nature of the disease, experience and understanding of certain limitations determine its diagnostic utility. In present study, cytological features of thyroid lesions were studied and correlated with histopathology wherever available to determine its diagnostic accuracy.

The sensitivity, specificity and accuracy of FNAC for malignancy



detection have eclipsed the diagnostic utility of other diagnostic methods and this procedure has assumed a dominant role in determining the managements of patients with thyroid lesions.

Fundamentals to the success are gathering of accurate and complete clinical history, technical competence in obtaining the aspirate, preparation of initial smears and their evaluation.

Accuracy of FNAC enables to proceed with surgery or not. It bridges the gap between clinical evaluation and final surgical pathological diagnosis in majority of cases. It helps the clinician to obtain a diagnosis in high percentage of cases with minimal expenditure of time and money and often to avoid unnecessary

surgery.

The scope and limitations of FNAC should be fully realized especially in the interpretation of Follicular neoplasms and also in various types of thyroid cancers especially Papillary carcinoma.

We stress the importance of observing nuclear features of the follicular cells in the cytological smears to avoid overdiagnosis of papillary carcinoma and follicular variants of papillary carcinoma. Even focal presence of papillary nuclear features in a follicular pattern should be dealt with caution. In ambiguous cases we recommend repeat aspirations to get adequate material to

rule out malignancy.

CONCLUSION:

The use of FNAC helps in early detection and proper managements of thyroid neoplasm. False negative and false positivity can be reduced by repeat aspiration, correct sampling from the lesions with meticulous examination and reporting.

Hence FNAC is a well established first line diagnostic test and effective screening tool which aid in the diagnosis and management of patients with thyroid lesions.

REFERENCE

1. Guhamallick M, Sengupta S, Bhattacharya NK, Basu N, Roy S, Ghosh SK et al. Cytodiagnosis of thyroid lesions – Usefulness and pitfalls: A study of 288 cases. *Journal of cytology* 2008; 25: 6-9. | 2. Gershengorn MC, Melung MR< Chu EW, Hanson TAS, Weintraub BD, Robbins J. Fine needle aspiration cytology in the preoperative Diagnosis of thyroid nodules. *Annals of internal medicine* 1977; 87, No.3: 265-269. | 3. Handa U, Garg S, Mohan H, Nagarkar N. Role of Fine needle aspiration cytology in diagnosis and management of thyroid lesions; A study of 434 cases. *Journal of cytology* 2008; 25: 13-16. | 4. Silverman JF, West LR, Larkin EW, Park HK, Finley JL, Swanson MS et al. The role of fine needle aspiration biopsy in the rapid diagnosis and management of thyroid neoplasm. *Cancer* 1986; 57: 1164-1170. | 5. Mundasad B, Mcallister I, Carson J, Pyper PC. Accuracy of Fine needle aspiration cytology in diagnosis of thyroid swellings. *The Internet journal of endocrinology* 2006; 2(2): 1504-1510. | 6. Kumar S, Aquil S, Dahar A. Role of Fine needle aspiration cytology in thyroid diseases. *Journal of surgery* 2008; 13(1): 22-25. | 7. Greenspan FS. The Role of Fine needle aspiration of biopsy in the management of palpable thyroid nodules. *AJCP* 1997; 108: 26-29. | 8. Anderson JB, Webb AJ. Fine needle aspiration biopsy and the diagnosis of thyroid cancer. *Br J Surg* 1987 Apr; 74(4) : 292-6 | 9. Gagnetten CB, Roccatagliata G, Lowenstein A , Soto F, Soto R. The role of Fine needle aspiration biopsy cytology in the evaluation of clinically solitary thyroid nodule. *Acta Cytol.* 1987 Sept-Oct; 31(5) : 595-8. |