



Fine-Needle Aspiration Cytology of Thyroid Nodules: Study of 100 Cases in Gajra Raja Medical College Gwalior (M.p.)

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ABSTRACT

BACKGROUND: Thyroid nodules are common and the principal method of diagnosis is fine-needle aspiration cytology (FNAC).

METHODS: To determine the value of FNAC in the diagnosis of thyroid nodules, thyroid cytology of 100 patients were observed from 01/07/2014 to 30/06/2015. FNAC was related with age,sex , benign and malignant pathology likelihood ratios were calculated. The method of FNAC and number of non-diagnostic aspirates were noted. The frequency of thyroid cancer was investigated in male and females who presented with thyroid nodule.

RESULTS: Out of 100 cases 74 were benign while 03 are malignant and 10 cases of inflammatory pathology. overall sensitivity of FNAC detecting thyroid neoplasia was 55.0%, specificity 73.7% and accuracy 67.2%.There were no false positive 'malignant' FNAC.

CONCLUSIONS: FNAC was essential to management in this series of patients. 'Malignant' or 'suspicious for malignancy' cytology are absolute indicators for thyroidectomy. FNAC should be undertaken with ultrasound guidance and if possible with a pathologist in attendance to assess sample adequacy. We recommend a high index of suspicion of thyroid cancer in the male patient who presents with a solitary nodule. If solitary nodules are to be observed, repeat FNAC should be undertaken because of the high false negative rate.

KEYWORDS : FNAC , THYROID , BENIGN , MALIGNANT.

BACKGROUND

Fine needle aspiration cytology (FNAC) of thyroid occupies an extremely important role worldwide. This minimally invasive and cost-effective technique is extremely useful in identifying a substantial proportion of thyroid nodules as benign and reducing unnecessary surgery for patients with benign disease[1]. Published data suggest that FNAC has an overall accuracy rate around 95% in the detection of thyroid malignancy [2].Nevertheless, like any other test, FNAC has its limitations and diagnostic pitfalls. These limitations include false negative and false positive results and a proportion of FNA results that are not obviously benign or malignant and fall into the indeterminate or suspicious group [3]. The reported pitfalls are those related to specimen adequacy, sampling techniques, the skill of the physician performing the aspiration, the experience of the pathologist interpreting the aspirate and the overlapping cytological features between some benign and malignant thyroid lesions [4].

The prevalence of thyroid lesions is higher in women (5%) than in men (1%)[2]However, most of the nodules are benign and depending on age, gender, radiation exposure history, family history, and other factors, malignancy can be present in 5-10% of nodules only.[5-6]

FNAC results were then compared with the definitive histological diagnosis which was considered the gold standard.Cases with cytohistological disparity were selected and reevaluated for the detection of possible cause. Some patients with benign diagnoses who did not undergo surgery were followed up with repeated clinico-radiologic assessment, and nodules showed significant growth, or cases showed recent clinical features of progression (hoarseness of voice, pressure symptoms) underwent a repeat FNAC.The sensitivity, specificity, diagnostic accuracy, of FNAC in diagnosing thyroid lesions were calculated according to the following equations.

MATERIALS AND METHODS

This study was carried out in the Department of Pathology, of a tertiary teaching hospital, from 01/07/2014 to 30/06/2015. FNA was performed in 100 patients, presenting with the thyroid swelling referred from the various departments.

All the cases of thyroid swellings were included in the study and all

the cases having neck swelling other than thyroid were excluded.

All the patients were carefully examined, and the procedure detail was explained to them in their language and a written consent was taken. Aspiration was done under aseptic precautions by 22-23 gauge needle, and both dry and wet smears were prepared. In cases of cystic and heterogeneous lesions or when ever cells were not retrieved by direct aspiration, guided aspiration was done. We categorized our results into inadequate/non-diagnostic, benign, follicular lesion of undetermined significance (FLUS)/atypia of undetermined significance (AUS), suspicious for malignancy and malignant sampling according to the recent Bethesda classification.

The FNAC results were compared with the histological diagnosis which was considered as gold standard. Cases with cyto-histological disparity were re-evaluated for a probable reason.

OBSERVATION AND RESULTS

Out of 100 cases with a thyroid swelling, 88 (88%) were females and 12 (12%) were males (M:F = 1:7). The age ranged from 12 years to 84 years with mean age of 37.86 years. FNAC results were interpreted according to Bethesda classification and showed 78 benign cases (78%), 5 FLUS/AUS cases (05%), 14 cases (14%) of follicular neoplasm/suspicious for follicular neoplasm, no cases of suspicious for malignancy, 03 cases (3%) malignant and no case reported as Inadequate/non-diagnostic. Colloid goiter was the most common diagnosis in benign lesions.

The malignant lesions showed papillary carcinoma (02 cases), medullary carcinoma (01 case).The FNAC diagnosis was compared with the corresponding histopathological diagnosis.Out of 100 cases of FNAC,only 18 thyroid specimens were subjected for histopathological evaluation.

In the present study, the sensitivity, specificity, and diagnostic accuracy of FNAC in diagnosing thyroid lesions were found 55%, 73.7% and 67.2%, respectively.

DISCUSSION

In thyroid disease, this advantage of early acquaintance of lesion is

established by FNAC which is a well recognize technique for pre-operative assessment of thyroid nodules. FNAC is safe, simple, and cost effective procedure that can be performed on out patients with wide patient acceptance. It provides a more rapid and accurate diagnosis of the thyroid nodule than any other combination of clinical or laboratory tests.

In our study, the age of the patients ranged from 12 years to 84 years with most of the patients in the third and fourth decade (mean = 37.86) which is similar to the previous studies.[7,8,9]

Females were more affected than males in this study, which showed concordance with the previous studies.[8-12]

The inadequacy rate in the present study was 0%.Previous studies have shown the variable percentage of inadequate material ranging from 0% to 25%,[7,13,14]Ali et al. suggested that the rate of non-diagnostic tests should be kept below 10%.15 Inadequate FNA specimen can occur as a result of sampling error, faulty technique and in highly vascular or focal lesions. Ultra-sound guided sampling reduces the non-diagnostic test result.

CONCLUSION

Thus, we conclude from this that FNAC is an excellent,safe diagnostic procedure with a high degree of accuracy and less invasive procedure than a tissue biopsy.

FNAC can also be used for monitoring therapy. Ultrasound guided biopsy is recommended in case of small lesions to avoid giving false negatives.Cases ofAUS/FLUS are followed by repeat FNAC, thus reducing the incidence of surgery in our study. Also application of various techniques like advanced imaging techniques, immune-cytochemistry, immunologic analysis, analysis of hormone receptors and electron microscopic study can result in further reduction in misdiagnosis and can considerably expand the diagnostic range and increase the diagnostic accuracy.

However, the exact incidence of malignancy in this heterogeneous category is difficult to predict as most of these cases are unlikely to be operated if the Bethesda recommendations are to be followed. There is a need for a large study with histopathological correlation for this category.

CHARTS AND FIGURES

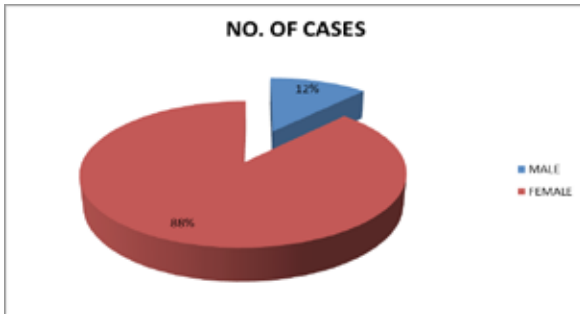
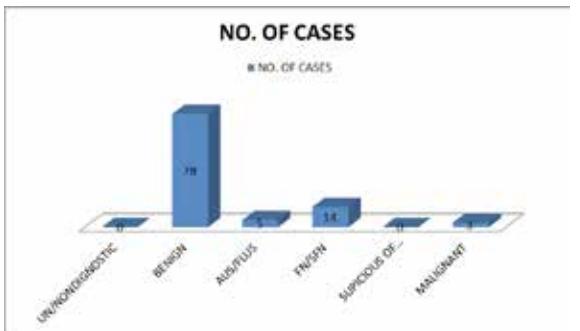
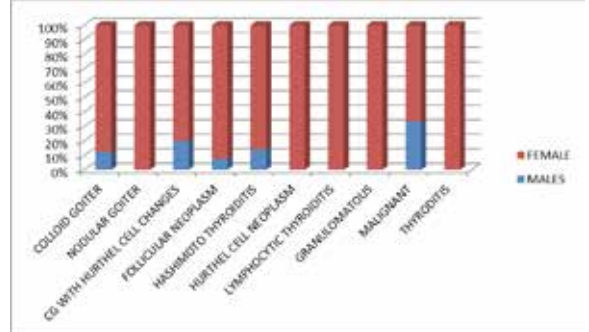


FIGURE 01. SHOWING NO. OF CASES OF THYROID SWELLING IN MALE AND FEMALE.



2.LESIONS CLASSIFIED AS BETHESDA SYSTEM.



3.SPECTRUM OF LESIONS OF THYROID IN PRESENT STUDY.

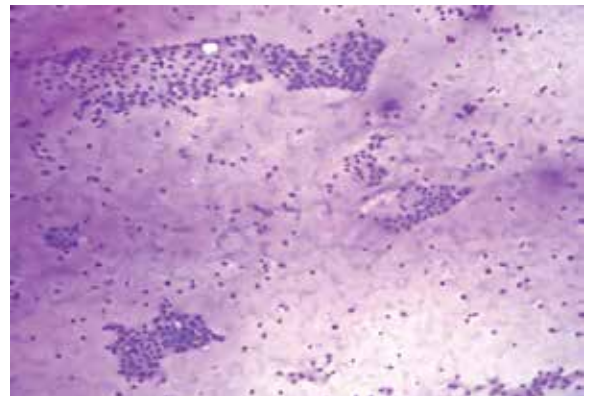


FIGURE 04. PHOTOMICROGRAPH OF SMEAR SHOWING CLUSTERS OF FOLLICULAR EPITHELIAL CELLS AGAINST COLLOID BACKGROUND (MGG x100).

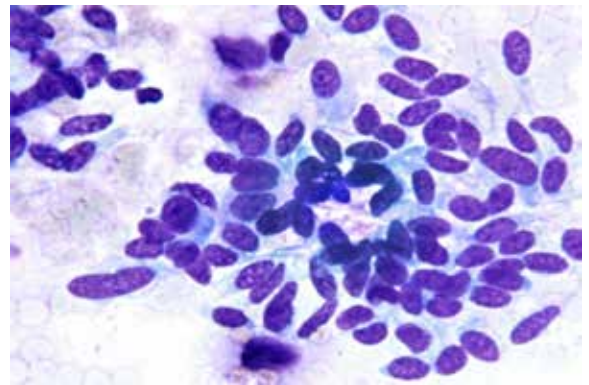


FIGURE 05.PICTOMICROGRAPH SHOWING PREDOMINANTLY SPINDLE CELLS WITH SCANT CYTOPLASM, ALONG WITH A SMALLER POPULATION OF OVOID CELLS WITH ECCENTRIC NUCLEI (MGG X400)

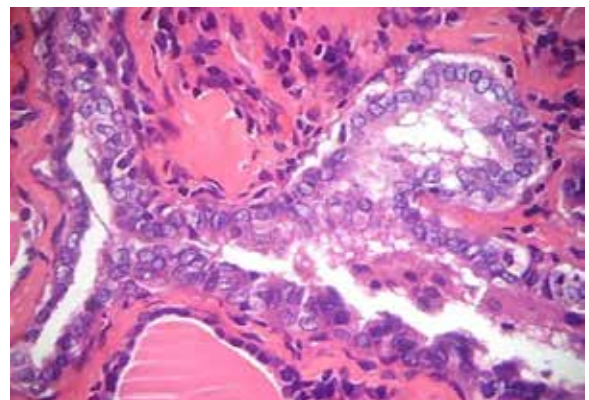


FIGURE 06.PICTOMICROGRAPH SHOWING HISTOLOGICAL APPEARANCE OF PAPILLARY CARCINOMA(X400 H&E)

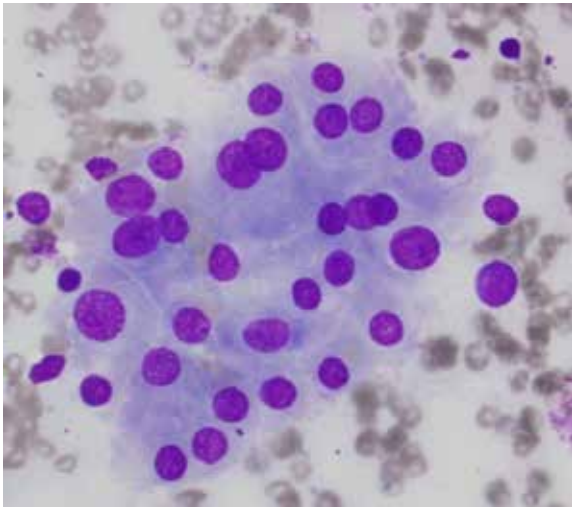


FIGURE 07. PICTOMICROGRAPH SHOWING HASHIMOTO THYROIDITIS(MGG X400)

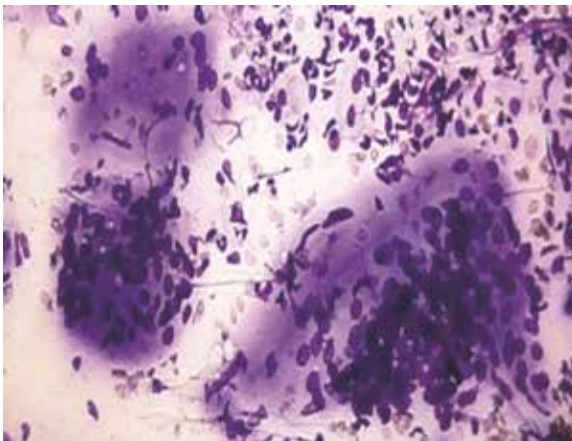


FIGURE 08. PICTOMICROGRAPH SHOWING GRANULOMATOUS THYROIDITIS (MGG X400)

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