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Research Article

Thyroid Nodule: Cytohistological Correlation

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Abstract: In the assessment of Thyroid lesions Fine needle aspiration cytology (FNAC) is widely considered as the diagnostic technique of choice. Retrospectively 96 patients with Thyroid nodules seen during the period August 2012 – July 2013 were analyzed to determine the utility and diagnostic accuracy in establishing the diagnosis of thyroid lesions.
Keywords: Thyroid nodule, Fine Needle Aspiration Cytology

INTRODUCTION

The incidences of clinically palpable thyroid nodules are 4-7%. They are more commonly seen in women. Though clinically noticed as a solitary nodule, most of them are nodular goiters and some of them are follicular adenomas. Out of all palpable thyroid nodules only 4-10% of them are malignant. Higher incidence is reported in women.

All patients with thyroid nodules should undergo Fine Needle Aspiration on solitary or dominant nodule of more than 10 mm in diameter for making a correct diagnosis and early appropriate treatment. This will reduce the need for surgery by 50% in cases with thyroid nodules. However recent reports showed that fine needle aspiration is used only in 52-84% of cases [1]. Before using the Thyroid scintigraphy and ultrasonography FNA should be used as an initial diagnostic test because of its superior diagnostic reliability and cost effectiveness [2]. However Fine needle Aspiration has some limitations like specimen inadequacy, sampling techniques, the skills of cytologist and technician may decline the diagnostic efficacy of this test [3, 4]. Other limitations are inadequate, indeterminate FNA and false negative and false positive repots [4]. This analysis of thyroid nodule cases is aimed to study to evaluate the diagnostic accuracy of thyroid Fine Needle Aspiration.

MATERIALS AND METHODS

This study was conducted at Mamata Medical College and Hospital, Khammam, Andhra Pradesh, India. The cases seen were from August 2012 to July 2013 with diffuse or nodular thyroid enlargement irrespective of age and sex. The analysis of cases include age, sex, past & present histories, detailed clinical examination, lab investigations including thyroid profile, ultrasound scan, FNA of thyroid nodule and histology reports if available.

It is the practice of this hospital to do FNA after a detailed clinical examination by an experienced cytologist under aseptic precautions, using 22 gauge needle and 5ml disposable syringe without local anesthetics. Then the aspirate was smeared on 2-3 microscope slides and fixed with isopropyl alcohol. Repetition of aspiration was done where first aspiration was inadequate.

RESULTS

A total of 96 patients were seen and underwent FNAC of thyroid nodules in our hospital during one year period (2012-13) in surgery department. Out of these, 90 (93.75%) are female patients while 6 (6.25%) are male. Age of the patients ranged from 15-65 years. Maximum patients (62) were seen in the age ranging from 21-55 years (64%). The results of Fine Needle Aspiration Cytology showed 74 (77%) with benign lesions and two cases (2%) were with malignancy. Another 4 cases were suspicious for malignancy (Follicular/ Hurthle cell). Out of remaining 16 patients in 6 cases were either unsatisfactory or non diagnostic and 10 cases were of atypical cells of undetermined significance (ACUS)/Follicular neoplasms of uncertain significance (FLUS). Out of all benign lesions Colloid Goiter was as the most frequently seen lesion (58 cases) and cystic lesion in 4 cases with unsatisfactory result group of lesions. The malignant lesions showed anaplastic or poorly differentiated papillary carcinoma.

Cytohistoconcordance is obtained in 36 cases out of 42 cases where histopathological diagnosis was available where as remaining 6 cases show discordant results. Of the 6 discordant cases 2 lesions suspicious for follicular neoplasms were reported as adenomatous goiter and remaining 4 cases with colloid goiter are

reported as follicular adenomas in histopathological examination.

DISCUSSION

Thyroid nodules are very common in 4% of the population aged between 30 and 60 years [5]. Majority of them are benign and malignancy was seen only between 10-20% of cases [6]. Surgical intervention as a diagnostic tool resulted with very low yield and very few diagnostic tests help in differentiating between benign and malignant thyroid nodules. Ultrasound scanning of thyroid can distinguish solid from cystic lesions, but all cystic lesions are not benign. Malignancy may be a possibility in cold nodules (nonfunctioning), where as hot nodules (functioning) are mostly benign. Thyroid isotope (Technetium-99m) scan is useful to finding out whether nodule is cold or hot. Less than 20% of all cold nodules are malignant and lead to high false positive rate and even thallium scan gives high false positive rates. Hence the routine use of isotope scans should be avoided, in view of their high cost, poor accuracy and significant radiation exposure to patients [10]. Thallium scan can be of use in follow up evaluation of post operative thyroid malignancy cases.

The diagnostic value and accuracy of fine needle aspiration cytology in the evaluation of thyroid nodules is well established and it will avoid unnecessary surgical intervention for diagnosis purpose. The reported sensitivity and specificity of the thyroid FNAC ranges from 43-99% and 47-100% respectively. Probably the factors contributing to this broad range are the handling of suspicious cases, the length of follow up and the inclusion of occult papillary carcinoma in the category of false negative diagnosis [4, 6, 8, 9, 12].

Histopathological samples are available in 12 out of 14 cases of ASCUS/FLUS and suspicious for neoplasia and malignancy cases. Out of 10 cases reported as ASCUS/FLUS 5 are reported as colloid goiter, 4 as follicular adenoma and 1 as follicular carcinoma. Out of 3 cases suspicious for follicular neoplasia on cytology, one each was reported as colloid goiter, follicular adenoma and follicular carcinoma in histopathology. The one lesion which is reported as suspicious of malignancy proved to be anaplastic carcinoma/poorly differentiated papillary carcinoma on histopathology.

It is difficult to differentiate follicular / Hurthle cell adenoma from carcinoma on cytological assessment because cytology cannot evaluate the criteria of vascular or capsular invasion or of intra thyroid spread. Greaves *et al.* [11] reported that out of 92cases 63 were of follicular lesions. There was no distinguishing cytological feature predictive of the histological outcome, may be due to the presence of various overlapping cytological features at the light microscopic level. There is a high possibility to be neoplastic. In this study 2 out of 4 cases (50%) are confirmed as carcinoma on subsequent histology comparable to reported 57-70% of thyroid aspirates [7]. Hence, it is better and reasonable to consider patients with suspicious FNA results for either repeat aspiration or surgical intervention.

False positive rates are 5.25% in this study comparable to other reports 0-9% [13, 14]. Papillary hyperplasia and hyperplastic nodules are common in adenomatous goiters could have been responsible for incorrect diagnosis of follicular neoplasia in 2 cases among follicular patterned smears. Cytological distinction between these conditions is often difficult due to the presence of various overlapping cytologic features. Architectural pattern and honeycomb sheets of adenomatous goiter versus syncytial type fragments with crowding of nuclei with irregular follicles of follicular neoplasia is an important criterion that distinguishes the two entities [14].

The false negatibve FNAC results may occur because of sampling errors or misinterpretation of cytology result in missing malignant lesions [5]. False negative rates in literature [15, 16] of 6.6 to 25% are comparable with this series , The high rate of failure to diagnose cancer is attributed to the failure of aspiration from precise locations. The present series achieved diagnostic accuracy of 89.7%, positive predictive value of 86.4% and negative predictive value of 94.1% which is similar to the experience of others [6,2]. Sclerotic lesions and from large areas of cystic degeneration and necrosis may be the reason for unsatisfactory samples. FNA of 9 patients (8.8%) in this study yielded inadequate samples compared to 6-32% [5].The advent of ultrasound guided FNA has improved sample acquisition in cases which are difficult to detect clinically. Borget *et al.* [17] concluded that routine Ultra sound scan guided FNA and proper site assessment for cytopathological adequacy would reduce cost. Repeat FNA should be performed by an expert operator and awareness of pathologist regarding changes occurring in thyroid following FNA procedure which have high negative value. A negative FNA should never exclude malignancy if there is a strong clinical suspicion. . Follicular patterned lesions and Hurthle cell rich smear offer diagnostic challenge perpetually.

An attempt is made to find out FNAC as an expedient, effective and safe diagnostic method for defining thyroid disorders and finding the level of cytohistological concordance. Understanding the pitfalls in FNAC of thyroid [18] like inadequate specimen, inaccurate selection of specimen site, inaccuracy in interpretation, interpretation errors, cysts, follicular lesions, Hurthle cell lesions and lymphocytic lesions and correcting them by getting aspirate from different portions of the nodule, Ultra sound guided

FNA, use of immune histochemical and molecular markers and reported by an expert cytologist may improve the FNA accuracy.

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