

Thyroid Gland Examination for Thyroid Nodule through Free Hand Fine Needle Aspiration Cytology (FNAC) Versus Ultrasound Guided Core Sampling

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ABSTRACT

Objective: To compare the free hand fine needle aspiration cytology versus ultrasound guided core sampling for thyroid nodule examination in thyroid gland.

Study Design: Retrospective study

Place and Duration of Study: Department of Surgery Unit-2, Ghulam Muhammad Mahar Medical College Hospital Sukkur from 1st January 2016 to 31st December 2021.

Methodology: One hundred patients were divided in two groups. Group A had 50 patients who undergo ultrasonography through Doppler scanning while Group B had equal number of 50 patients which underwent free hand fine needle aspiration cytology. The clinical details were noted and graded as un-satisfactory or lacking follicular cells or else having <6 groups epithelial cells or having sufficient number of follicular cells.

Results: The mean age was 31.5±11.8 years and majority of the patients were females 54% in comparison with 46% males. Insufficient cytopathologic cells were noticed in 18% US guided thyroidal nodule examination while similar insufficiency was seen in 44% fine needle aspiration cytology examination. The adequate cytopathological cells were noticed in 82% Ultrasounds while same was only seen in 56% fine needle aspiration cytology.

Conclusion: Ultrasound guided core sampling has presented higher adequate cytology cases in comparison to free hand fine needle aspiration cytology cases.

Key words: Fine needle aspiration cytology, Ultrasonography, Thyroid nodule

INTRODUCTION

Soft tissue tumors are hard to identify and needs critical procedure for their proper assessment. Fine needle-aspiration cytology is a well-accepted technique for the diagnosis of tumors within the soft tissue.^{1,2} The history of evaluation of a mass in neck region ranges later as in mid nineteenth century. Fine needle procedure was almost started a century later using an eighteenth gauge needle.^{2,3} With the advancement of the science the tumor studies using fine needle has been assisted with various other techniques including staining methods and modern imaging techniques.⁴

Iodine deficiencies are highly prevalent in under developed countries and developing countries due to lack in proper nutritional components. This deficiency leads into thyroidal defects. A thyroid nodule impaired etiology is reported in 3.2% of iodine deficient population which requires further surgical assessment.⁵ Fine needle aspiration cytology is considered as a clinically mandatory protocol for assessment of these thyroidal nodules. However, if follicular lesions are presented than FNAC conductance becomes limited.

In conditions as multi-nodular goiter also the differentiation between follicular neoplasm and hyper plastic nodule becomes extremely difficult. Further cases have been reported which has produced unsatisfactory results with primary FNAC and requires repetitive examination.^{6,7} Many of the studies have reported that US guided cytology or S guided cytology in addition to FNAC free hand delivers better satisfaction of cytological reports.⁸⁻¹⁰ The present study was conducted to analyze the efficiency of both of the techniques in patients who requires thyroidal nodule identification.

MATERIALS AND METHODS

This retrospective study was conducted Department of Surgery Unit-2, Ghulam Muhammad Mahar Medical College Hospital Sukkur from 1st January 2016 to 31st December 2021. The study included those patients who required clinical assessment of thyroid nodules present in thyroid gland due to their underlying conditions related with thyroidal disease. A total of 100 patients were divided

in two groups. Group A had 50 patients who undergo ultrasonography through Doppler scanning while Group B had equal number of 50 patients which underwent FNAC. The choice of FNAC or US was done after clinical assessment and crucial condition of patient. Patients in which dominant nodule was seen were preferred for FNAC. An informed consent was taken from each patient before enrolment as a study participant. The demographic details, gender, clinical findings from both method of assessment were recorded. The clinical details were noted and graded as un-satisfactory or lacking follicular cells or else having <6groups epithelial cells or having sufficient number of follicular cells. Data was analyzed using SPSS-25.0 through Chi square with p<0.05 as significant.

RESULTS

The mean age was 31.5±11.8 years with age ranged between 15-67 years with majority of the patients as females with 54% in comparison with 46% males (Table 1). Insufficient cytopathologic cells were noticed in 18% US guided thyroidal nodule examination while similar insufficiency was seen in 44% FNAC free hand examination.

Table 1: Descriptive analysis of the patients (n=100)

Variable	US Guide	FNAC Free Hand	P value
Age (years)	33.5±11.5	29.5±12.2	0.21
Gender			
Male	24 (48%)	22 (44%)	0.33
Female	26 (52%)	28 (56%)	0.35

Table 2: Comparison of sufficient or insufficient cytology in both groups (n=100)

Cytology	US Guide	FNAC Free Hand	P value
Insufficient	9 (18%)	22 (44%)	0.002
Sufficient	41 (82%)	28 (56%)	0.042

The adequate cytopathological cells were noticed in 82% Ultrasounds while same was only seen in 56% FNAC and the difference was significant (P<0.05) between both techniques

(Table 2). This study showed that on excluding the colloidal nodules as well as cysts the adequate cytology was gained in group A such as of ultrasound guided cytology in comparison with group B. No clinical complications noticed in both groups (Fig. 1).

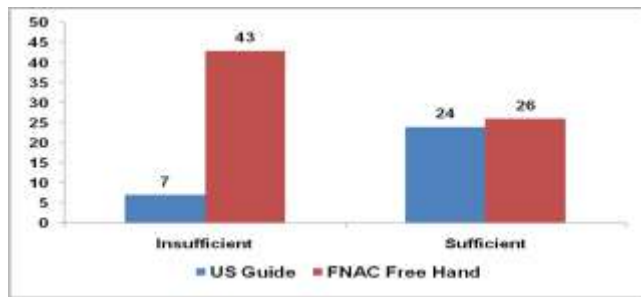


Fig. 1: Comparison of sufficient or insufficient cytology in both groups excluding the colloidal nodules and cysts

DISCUSSION

General surgery and ENT department commonly deals with swollen neck presentation of patients from various age groups. In neck swollen cases linked with thyroidal nodules FNAC is a standard procedure applied for better assessment. Free hand FNAC is considered as an efficient and fast procedure which is also cost effective. Despite all the advantages of free hand FNAC there limitations are also seen especially in cases of follicular-lesions. Consequently, this technique can result in producing false negative or false positive results.¹¹ Various studies have reported inadequate cytology through free hand FNAC with a percentage range between 5-43%.¹²⁻¹⁷ The present study also reported a similar result with an inadequacy up to 44%. As a result of these inadequacies a repetitive FNAC has to be performed.

Recent literature as supported the ultrasonography guided samples or cytological examination with a high sensitivity and specificity index specifically in cases of neoplasia diagnosis. The inadequacy value is also found to be less high than in free hand FNAC.¹³⁻¹⁵ Similar results have been reported from the present study as well. Another study has reported adequacy from US guided cytology as 68-85%^{18,19} while the current study reported adequacy in 82%.

Another advantage of ultrasonography is identification of nodules which otherwise becomes difficult by palpitation especially in cases where dominant nodule is not presented. The complication risk in both these techniques is negligible with seroma or subcutaneous hematoma formation through FNAC in rare cases.²⁰⁻²² Similar has also been reported in the present research.

CONCLUSION

Ultrasound guided core sampling has presented higher adequate cytology cases in comparison to free hand FNAC cases. Both techniques are safe and are associated with negligible complication risk.

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