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Research Paper

Techniques of Thyroid Cytology and its Diagnostic Adequacy

Medical Science

KEYWORDS : FNAC, FNNAC, DIAGNOSTIC ADEQUACY, THYROID CYTOLOGY.

DR.BHARATHI K — ASSOCIATE PROFESSOR OF PATHOLOGY, MADHA MEDICAL COLLEGE AND RESEARCH INSTITUTE, KOVUR CHENNAI – 600122

DR.K.R.UMADEVI — PROFESSOR & HOD OF PATHOLOGY, MADHA MEDICAL COLLEGE AND RESEARCH INSTITUTE, KOVUR CHENNAI – 600122

ABSTRACT

INTRODUCTION: Fine needle cytology is easy to perform, quick and has a high degree of specificity and sensitivity. FNAC (Fine Needle Aspiration Cytology) and FNNAC (Fine Needle Non Aspiration Cytology) are the two techniques of fine needle cytology (FNC).

AIM AND OBJECTIVES: To assess the diagnostic superiority and adequacy of two techniques

MATERIALS AND METHODS: This study was conducted at Madha Medical College and Research Institute in Tamilnadu. This study included 120 patients who attended the cytology department for FNC of thyroid swelling.

RESULTS: FNNAC technique produced more number of superior quality smears and results were found to be statistically significant (P<0.05). Diagnostic Adequacy of FNAC is 75% and FNNAC is 81%.

DISCUSSION: Thyroid lumps are commonly seen in females (95%). Superior quality smears were obtained from FNNAC technique. FNAC is useful in cystic lumps as it allows the drainage of fluid material.

CONCLUSION: FNNAC is the preferred technique for thyroid lesions as there is more material with less admixture of blood.

INTRODUCTION

Fine needle cytology (FNC) has gained tremendous popularity in recent times among the clinicians and the pathologists. FNC is used to sample all superficial mass lesions and even deeply seated lesions. Deeply seated lesions can be sampled with the aid of imaging techniques. The basic principle underlying fine needle aspiration cytology is the aspiration of cellular material from the target masses often utilizing fairly high suction pressure. [1]

AIM AND OBJECTIVE

To assess the diagnostic superiority and diagnostic adequacy of two techniques of fine needle cytology ie..FNAC and FNNAC .

MATERIALS AND METHODS

This study was conducted at Madha Medical College and Research Institute in Tamilnadu. This study included samples obtained from 120 patients who attended the cytology department for FNC of thyroid swelling. A clear explanation was given to the patient about the procedure. A written consent was obtained first as cooperation of patient to procedure is very essential. .A 10 ml plastic syringe attached with a needle (22 gauge or 25 gauge) was held in the right hand. Two fingers of the left hand firmly grasp the nodule. Then the needle was rapidly inserted through the skin into the nodule. Once the needle tip is in the nodule, gentle suction was applied while the needle is moved back and forth in the nodule vertically. This manoeuvre allows the dislodging of cellular material and easy suction into the needle . For FNNAC technique, patient preparation is similar to that of FNAC . However no syringe or suction is necessary for this technique. The slides were fixed in 85% of the Isopropyl alcohol. The slides were stained with Harris Hematoxylin and 1% aqueous Eosin once. The slides were then washed in water. Finally the slides were dried and mounted in D.P.X.

OBSERVATION AND RESULTS

In the 120 cases of thyroid swelling there were 12 males and 108 Females. The morphologic spectrum of thyroid lumps were shown in the table 1. Diagnostic Adequacy of FNAC is 75% and FNNAC is 81%.

TABLE – 1

S.no	Diagnosis	Total
1	Hashimotos thyroiditis & Lymphocytic thyroiditis	28
2	Nodular colloid goitre & colloid goitre	70
3	Cystic colloid nodules	12
4	Papillary carcinoma	6
5	Follicular neoplasm	4
6	Total no of cases	120

We did a comparative study of FNAC and FNNAC and cytology smears were scored by Mair's scoring system on the basis of following five objective parameters diagnostic adequacy, retention of architecture, degree of trauma, degree of cellular degeneration and background blood or clot obscuring the background as shown in table 4.[2] The smears were classified as Diagnostically Unsuitable -- score 0-2 , Diagnostically Adequate -- score 3- 6. Diagnostically superior – score 7-10.

TABLE 2:

Criterion	Quantitative description	points
Amount of cellular material	Absent Minimal Sufficient for cyto diagnosis	0 1 2
Retention of appropriate architecture	Minimal diagnosis not possible Moderate Excellent; architecture diagnosis obvious	0 1 2
Degree of cellular degeneration	Marked; diagnosis impossible Moderate; diagnosis possible Minimal diagnosis obvious	0 1 2
Degree of cellular trauma	Marked; diagnosis impossible Moderate; diagnosis possible Minimal diagnosis obvious	0 1 2
Background blood or clot	Large amount ; great compromise to diagnosis Moderate diagnosis possible Minimal; diagnosis easy	0 1 2

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TABLE - 3

S. NO	GRADING OF SMEARS	FNNAC	FNAC
1	Diagnostically unsuitable	12	14
2	Diagnostically adequate	21	36
3	Diagnostically superior	27	10

After adding up all the scores, a total average score per case as well as average score for each parameter in each case were obtained and tabulated AS TABLE 3. The average score obtained by FNNAC from thyroid lesions is 5.7 whereas by FNAC is 4.8 (table 4). On considering all the observations and results of each technique in thyroid , the number of superior quality smears are more from FNNAC technique (27 Vs 10) and this difference is found to be statistically significant, P<0.05 (table 3).

TABLE – 4

PARAMETER	FNAC	FNNAC
ADEQUACY	1.325	1.445
ARCHITECTURE	1.055	1.2675
CELLULAR DEGENERATION	0.96	1.1
CELLULAR TRAUMA	0.86	1.083
BACKGROUND BLOOD	0.816	1.1

DISCUSSION

Fine needle cytology of thyroid has been established as a first line diagnostic test for the evaluation of goitre and the single most effective test for the preoperative diagnosis of a solitary nodule. The main indications for FNC are diffuse non toxic goitre , solitary or dominant thyroid nodule and to confirm a clinically obvious thyroid malignancy.[3] FNC can reliably confirm benignity in about 60% of benign thyroid nodules. In diffuse non toxic goitre, FNC provides reliable distinction between colloid goitre and autoimmune thyroiditis since the treatment is different for both. Antibody levels and TSH level estimation was also useful to confirm the diagnosis.

The main limitation of thyroid FNC was the inability to distinguish between follicular adenoma and carcinoma.[4] This distinction depends mainly on the demonstration in tissue sections of capsular invasion or vascular invasion. In papillary carcinoma of thyroid, the recognition of the characteristic nuclear morphology of papillary carcinoma is easier in cytology smears. The complications associated with thyroid FNC are hematoma, transient laryngeal nerve palsy, puncture of trachea causing coughing spasms, organisation of hematoma and necrosis which can mimic a sarcoma or angiomatous tumor. Damage to the capsule by needling may simulate capsular invasion.

On analysing the number of superior quality of smears obtained from each technique in thyroid lesions , it is more from FNNAC technique [FIGURE 1, FIGURE 2, FIGURE 3] . The difference is also found to be statistically significant , P value < 0.05. For highly vascular organs like thyroid , FNNAC is the preferred technique as there is more material with less admixture of blood. For the cystic lesions of thyroid, FNAC is the procedure of choice as it allows the drainage of fluid material and therapeutic in some cases and yield more diagnostic material. The decision to use either FNNAC or FNAC may be decided on the basis of site, size and nature of lesion (solid or cystic).

CONCLUSION

FNNAC technique produced more number of superior quality smears and it was found to be statistically significant (P<0.05). Diagnostic Adequacy of FNAC is 75% and FNNAC is 81%. FNNAC is the preferred technique as there is more material with less admixture of blood.

IMAGES:

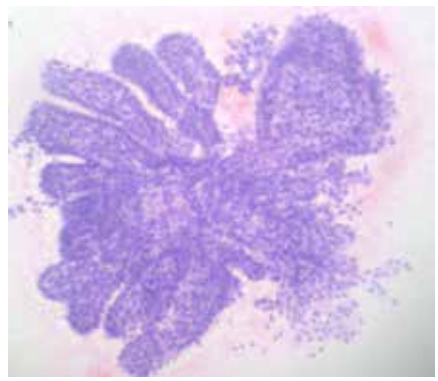

FIGURE 1: Smear shows follicular epithelial cells arranged in papillary pattern (40X).

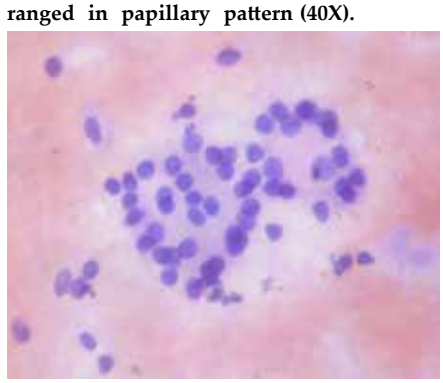

FIGURE 2: Smear shows repetitive micro follicles. Follicular epithelial cells are equal sized with mild increase in N/C ratio (400X).

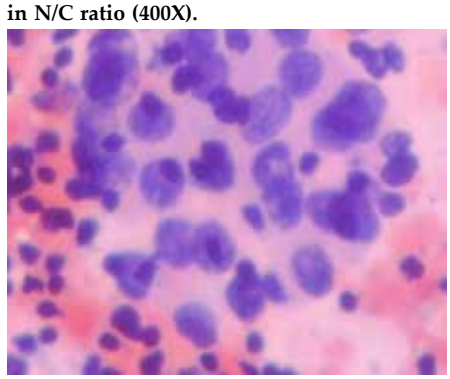

FIGURE 3: Smear shows Hurthle cells with moderate anisonucleosis in a background of lymphocytes (400X).

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