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A Study On The Cytological Grading In Fine Needle Aspiration Cytology Smears Of Common Surgical Swellings.

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ABSTRACT

Aspiration cytology is one of the first-line diagnostic tests in thyroid malignancies. Fine-needle aspiration cytology (FNAC) in thyroid lesions causes hemorrhagic smear and cell trauma, often leading to the repetition of smear and delay in diagnosis. This study was conducted to identify the diagnostically superior technique with regard to thyroid swelling and to assess the quality of smears obtained from FNAC and fine-needle nonaspiration cytology (FNNAC). To compare the cytological grade with a histopathological grade in surgical specimens and biopsies of common surgical swellings. The specimen of the swellings was fixed at 10% buffered formalin. Gross features were recorded. The specimens were processed and stained routinely with Hematoxylin and Eosin stain. Grading of these slides was done by the method of Nottingham modification of the Bloom Richardson method. Then the cytological grade was compared with the histological grade. The commonest causes of the breast lumps, presented here were, fibroadenoma in case of benign swellings and infiltrating ductal carcinoma among malignant varieties. In both the conditions FNAC & histopathological procedures done. The reports are found to be same in both procedures in most of the cases which is statistically evident. This is confirmed by using two-way proportion Z test, the P values are calculated. So FNAC is useful in diagnosing these two diseases. In fibro adenosis, FNAC reports are not conclusive needing further HPE for confirmatory diagnosis. There is no statistical correlation between the two reports calculated for fibro adenosis proving that HPE is needed to diagnose this swelling. However, Phyllodes tumour could be diagnosed with FNAC alone. FNAC is highly sensitive in diagnosing neoplasms of breast, Thyroid and Parotid. Lymphomas can be found out by FNAC but typing of Lymphoma needs excision biopsy. Benign swelling of the breast (Fibroadenoma), Parotid (Pleomorphic Adenoma), soft tissue (lipoma) can be diagnosed with high accuracy by FNAC.FNAC is useful in conjunction with clinical radiological findings to provide best possible initial assessment

Keywords: Aspiration cytology, fine-needle aspiration cytology, Mair's score, nonaspiration,

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INTRODUCTION

FNAC is the first choice for the initial investigation and diagnosis of both superficial and deep lesions though core needle biopsy is extremely valuable in selected cases. FNAC is not only limited to neoplastic conditions, but FNAC is valuable in the diagnosis of inflammatory, infectious and degenerative conditions. [1]. It is relatively painless and produces a speedy result. It is cost effective. Its accuracy in many situations can approach that of histopathology in providing an unequivocal diagnosis in the experienced hands. It is applicable when the lesions are easily palpable [2]. The risk of needle tract seeding is extremely low, when truly fine needles of twenty-two gauge or less are used [3]. The success of FNAC depends on the representativeness, adequacy of sample and high quality of preparation [4]. At the community level, FNAC may be regarded as a simple screening test for serious disease, which needs further investigation and referral to a specialist. In the majority of the hospitals, it is an essential component of the final preoperative or pretreatment investigations on which the management of the problem is based [5]. There would be little danger in extracting a small quantity of tissue from an obscure growth by the aid of a needle, trocar or cannula. So, little substance is necessary for the microscope that the diagnosis of cancer would no longer be equivocal or vague [6,7].

MATERIALS AND METHODS

Cytologically confirmed surgical swellings cases with respective specimens received in the department of pathology, Government Medical and Hospital, Ariyalur was studied over a period from August 2022 to Nov 2023.The specimen of the swellings was fixed at 10% buffered formalin. Gross features were recorded. The specimens were processed and stained routinely with Hematoxylin and Eosin stain. Grading of these slides was done by the method of Nottingham modification of the Bloom Richardson method. Then the cytological grade was compared with the histological grade

Statistical Analysis

Data were analyzed by using Spearman's correlation coefficient (r value) for correlation of cytological grading with histological grading. Also statistical test was applied to determine the p value to find the association between two grading systems.

RESULTS

Out of these 200 patients, 40 were males and 160 were females. As there was more number of breast and thyroid swellings in the study, females outnumbered than males. The commonest causes of the breast lumps, presented here were, fibroadenoma in case of benign swellings and Infiltrating ductal carcinoma among malignant varieties. In both the conditions FNAC & histopathological procedures done. The reports are found to be same in both procedures in most of the cases which is statistically evident. This is confirmed by using two- w a y proportion Z test, the P values are calculated. So FNAC is useful in diagnosing these two diseases. In fibroadenosis, FNAC reports are not conclusive needing further HPE for confirmatory diagnosis. There is no statistical correlation between the two reports calculated for fibroadenosis proving that HPE is needed to diagnose this swelling. However, Phyllodes tumour could be diagnosed with FNAC alone. Among the thyroid tumours for multinodular goiter and Papillary carcinoma of thyroid FNAC is conclusive which is statistically proved, so FNAC has more conclusive in diagnosing these thyroid diseases compared to histopathological examination. In cases of follicular neoplasms, malignant features are diagnosed by histopathologically. In adenomatous goiter P value is found to be significant so FNAC procedure is not much useful. So further HPE needed to confirm the diagnosis. In TB adenitis & in metastatic lymph node by using Two way proportion Z test P value for each condition was calculated and was found to be insignificant. So FNAC is the useful procedure in confirming these diseases. In cases of the primary tumours of lymph nodes where FNAC Procedures was done , the reports came as lymphoproliferative disorders. So Histopathological procedure is the ideal one in both confirmation and classification of these tumours and the above is statistically proven. In Reactive lymph adenitis P values are calculated and it was found to be Insignificant, so FNAC is the diagnostic procedure in this lymph node disorders Compared to histopathological examination. In partotid gland tumours both benign & malignant tumour Conditions are subjected to histopathological

examination & FNAC procedures. The FNAC results are same as that of HPE reports which is Statistically proved, so FNAC is conclusive in making the diagnosis. Obviating further HPE. In soft tissue tumours, FNAC was no difference with that of HPE in diagnosing Mesenchymal neoplasms was and lipoma. this is statistically proved. P values for Malignant peripheral nerve sheath tumour & in schwannoma were calculated and it was found to be insignificant. So, FNAC is much useful to diagnose MPNST & schwannoma One case reported as lymph cyst of thyroid turned out to be papillary carcinoma on histopathological examination. One case of the MNG was reported as Follicular neoplasm of thyroid in FNAC. Three patients who were reported as nodular goiter in FNAC, found to be having Thyroiditis (Autoimmune) from the Histopathology reports. Less than 25 yrs Females presented with fibroadenoma are Subjected to FNAC & histopathological examination, there is no much difference between FNAC and HPE results. In cases of lymphomas, for detecting the subtypes of Hodgkin's & non-Hodgkin's and for immunohistochemistry, histopathological procedure is needed. It is not possible with FNAC to diagnose the subtypes of HL and NHL. The diagnosis of the malignant neoplasm of soft tissues is confirmed by trucut biopsy, so FNAC is not useful in diagnosis. the limitation of this study; the results cannot be generalized.

Table 1: Breast

AGE (Years)	FA	Phylloides	IDC
10-20	22	-	-
21-30	10	1	4
31-40	7	2	13
41-50	-	1	9
>50	-	-	9

Table 2: Thyroid

AGE (Years)	Adenoma	MNG	PTC
10-20	-	2	-
21-30	2	10	2
31-40	-	10	3
41-50	2	5	-
>50	2	1	1

Table 3: Lymphnode

AGE (Years)	TB	Lymphoma	Metastasis
<10	1	-	-
11-20	2	3	-
21-30	3	2	-
31-40	-	2	1
41-50	-	2	1
>50	-	4	2

Table 4: Parotid

Age Years	Pleomorphic Adenoma	Carcinoma
10-20	-	1
21-30	2	2
31-40	-	2
41-50	1	-
>50	2	2

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Table 5: Breast Diseases

DISEASES	FNAC	HPE	P
FA	47	40	0.786
IDC	33	33	1.00
Fibroadenosis	4	8	0.059
Fibrocystic Disease	3	4	0.699
Phyllodes	4	6	0.515
Medullary Ca	0	2	0.155
Suppurative Lesion	0	1	0.316
Tubular Adenoma	0	1	0.316
Total	91	91	

Table 6: Thyroid Diseases

DISEASES	FNAC	HPE	P
MNG	24	27	0.523
Adenomatous	6	3	0.291
PCT	8	7	0.777
Colloid	4	2	0.398
Follicular	2	2	1.000
Lymph Cyst	1	0	0.314
Hashimoto/Autoimmune Thyroiditis	0	4	0.040
Total	45	45	

Table 7: Lymph Node Swellings

DISEASES	FNAC	HPE	P
Lymphoproliferative/HL/NHL	11	12	0.783
Tb Adenitis	8	9	0.769
Reactive	5	3	0.443
Metastatic	2	2	1.00
Infected Cyst Neck/Bronchial Cyst	1	1	1.00
Total	27	27	

Table 8: Salivary Gland Swellings 1

DISEASES	FNAC	HPE	P
Pleomorphic	10	9	0.803
Monomorphic	1	1	1.00
Mucoepidermoid Ca	3	3	0.418
Chronic Sialadinitis	3	3	1.00
Acinic Cell Ca	0	1	0.31
Total	17	17	

Table 9: Soft Tissue Swellings

DISEASES	FNAC	HPE	P
Lipoma	9	9	1.00
Mesenchymal	8	6	0.036
MPNST	1	1	1.00
Schwannoma	2	2	1.00
Total	20	20	

DISCUSSION

The incidence of breast cancer in India is increasing now days and approaching to that in the western world. The incidence of early detection of breast cancer is increasing dramatically due to public awareness and widespread use of mammography. However, no significant decrease in mortality from breast cancer has yet been noted [8]**.** The literature sensitivity in the diagnosis of carcinoma breast was 90-95%. In our study it was proved and almost matches the literature sensitivity. The commonest benign swelling of the breast, fibroadenoma, is also diagnosed by FNAC and statistically proved [9]. Ashcroft & Von Henle achieved a diagnosis of thyroid neoplasm in the accuracy of over 90%. Papillary thyroid carcinoma had an accuracy of 80% in the study. In lymphnode swellings, role of FNAC in diagnosing lymphoma, Tuberculosis, and metastatic node is much important, which is statistically proved in our study, this almost approaches the recommended value from other studies of 84-98% for lymphoma and 90-96% for metastasis [10]. The study conducted at PGI, Chandigarh showed sensitivity for lymphoma, TB & metastasis as 64.8%, 60.5% and 71.6% respectively [11]. Karolinska produced accuracy of more than 90% in neoplasm's of salivary glands. In 1994 reviews, they produced sensitivity of 81-100% and accuracy of typing in 61-80% [12]. Our study results also prove same that of literature results. The reported sensitivity of 100% lipoma, 82% for mesenchymal malignancy in this study differs a little from the literature results of 86% for benign and 88% for malignant soft tissue tumours [13]. The lesser sensitivity of FNAC for the diagnosis of fibroadenosis is due to the variable responsiveness of the breast tissue portions to hormonal stimuli and cytology taken from unresponsive fibrous portions [14]. The false positivity in case of papillary carcinoma and Follicular carcinoma I MNG may be due to papillary and follicular pattern observed in the follicle lining epithelium, while they are in a transforming state of non-toxic to toxic. This can be minimized by careful study cytology. Lymphomas would not be typed from FNAC, even though it is reported as lymphoproliferative disorder. So it would be better to go for excision biopsy if lymphoma is suspected [15].

CONCLUSION

FNAC is highly sensitive in diagnosing neoplasms of breast, Thyroid and Parotid.Lymphomas can be found out by FNAC but typing of Lymphoma needs excision biopsy.Benign swelling of the breast (Fibroadenoma), Parotid (Pleomorphic Adenoma), soft tissue (lipoma) can be diagnosed with high accuracy by FNAC.FNAC is useful in conjunction with clinical radiological findings to provide best possible initial assessment.The diagnostic accuracy not only depends on responsiveness of the aspirate but also on the quality of cytological preparation.Repeat FNAC sampling over a period of time reduces the false negative rates.

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