



Diagnostic Value of Image Guided Fine Needle Aspiration Cytology - A Retrospective Study

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ABSTRACT

Background: - Image guided aspiration cytology has become routine procedure for any deep seated lesions in major academic institute. It is a simple rapid, noninvasive & economical procedure.

Aims: - For diagnosis of unapproachable deep seated lesions and to correlate with histopathological examination.

Material and Methods: - Details of total 75 patients with relevant history were taken in each image guided aspiration of various lesions. The study was carried out from year 2012 to 2014 over a period of 3 years. The lesions were of Intraabdominal, Thoracic, Lymph node, Head & neck, Musculoskeletal & Breast. The procedure was conducted in Radiology department.

Result: - Out of total 75 cases 36(48%) were males and 39(52%) were female. Age ranges from 8 years to 76 years. Region wise frequencies of FANC were Abdomen- 26(34.7%), Lymphnode-15(20%), Thorax-12(16%), Head & Neck-13(17.3%), Musculoskeletal-05(6.7%) & Breast-04(5.3%). In our study Diagnostic accuracy was 97.3%

Conclusion: - Image guided FANC should be used as routine procedure in deep seated lesions due to high sensitivity & specificity rate.

KEYWORDS : Image Guided, Aspiration Cytology, Deep Seated Lesions.

INTRODUCTION

Now a day's fine needle aspiration cytology is assuming increasing importance in practice of pathology & practiced today as an interpretative art with histology. Newer development in Radiology has completely revolutionized the approach to percutaneous aspiration of space occupying deep seated lesions making it rapid, inexpensive, versatile & an adjunctive tool for evaluating internal organs^{1,2,3} such few imaging modalities are USG, CT, MRI etc. Pathologist can guide to different areas of lesions, such as periphery instead of central necrotic area of solid lesions or cystic areas² USG guided FNAC has advantages of mobility of 3- dimensional display & no radiation with limitations like poor needle visibility during procedure & limited by gas/bone. MRI guided FNAC is useful for small lesions and it is highly sensitive while limitations like cost effect⁴

AIMS AND OBJECTIVES

- 1) For diagnosis of unapproachable deep seated lesions and to correlate results with histopathological examination.
- 2) To assist the surgeon in selection of patient for surgery or palliative therapy.

MATERIALS AND METHODS

Details of total 75 patients with relevant history were taken. The study was carried out from years 2012 to 2014 over a period of 3 years. The diagnosis and findings of both the aspirate and biopsy were evaluated and compared with each other. Image guided FNAC was performed in Radiology department.

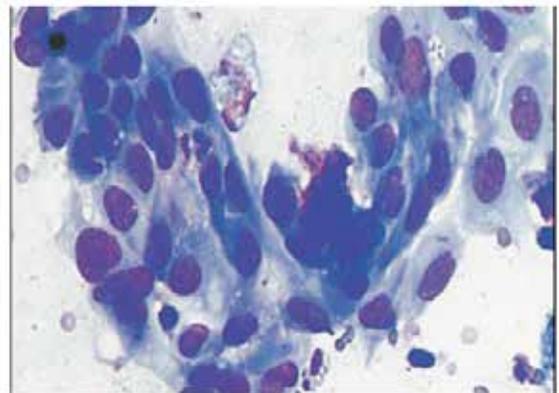
Aspiration was done with 20-22 gauges simple or lumber puncture (LP) needle.

10 to 20 ml syringe was attached and aspiration was carried out. Ma-

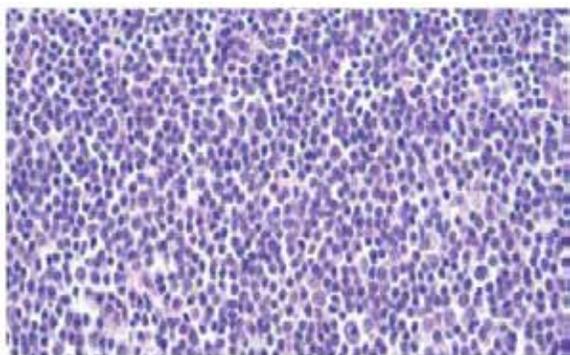
terial was spreaded with the help of another slide. In cystic lesion, aspirate fluid was collected in test tube and centrifuged preparations were made.

The smears were fixed in 95% ethyl alcohol and stained with H & E (Hematoxylin and eosin).

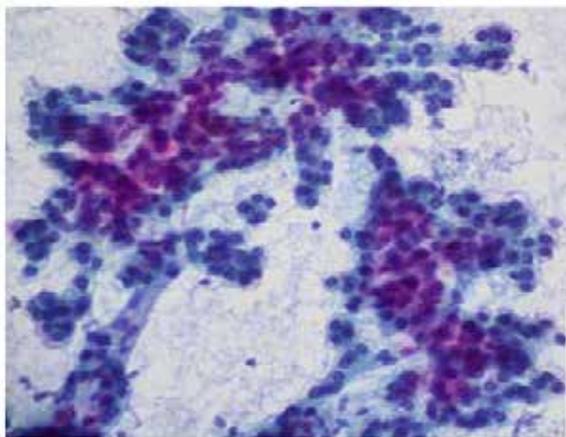
PHOTOMICROGRAPHS



Squamous cell carcinoma-Lung



Non Hodgkin's Lymphoma



Hepatocellular carcinoma

RESULTS AND OBSERVATIONS

Total 75 cases of different organ system were studied by image guided FNAC. The study was followed by Histopathological Examination. Out of total 75 patients, 36 were males & 39 were females. Age ranges from 8 to 76 years.

1) IMAGE MODALITY WISE FREQUENCY OF FNAC

IMAGE MODALITY	FREQUENCY	PERCENTAGE (%)
USG Guided	68	90.7
CT Guided	07	9.3
Total	75	100

2) REGION WISE FREQUENCY OF FNAC

Region	No. of cases	Percentage (%)
ABDOMEN	26	34.7
LYMPH NODE	15	20.0
THORAX	12	16.0
HEAD & NECK	13	17.3
MUSCULOSKELETAL	05	6.7
BREAST	04	5.3
TOTAL	75	100

Inadequate sampling was not reported in any patient.

HPE correlation was available in 73 (97.3%) cases while not available in 2 (2.7%) cases. Out of 73 cases, HPE diagnosis was different from FNAC diagnosis in 2 (2.7%) cases. Both were diagnosed as benign on FNAC (Chronic non specific lymphadenitis & Nodular goiter with cystic change) while malignant on HPE (Non Hodgkin's Lymphoma & Papillary carcinoma) respectively.

3) ORGAN WISE FREQUENCY OF FNAC

Region	No. of cases	Percentage (%)
Lymph node	15	20
Lung	08	10.7
Liver	07	9.3
Thyroid	07	9.3
Retroperitonium	06	8.0
GIT	05	6.7
Gall Bladder	05	6.7
Musculo-Skeletal	05	6.7
Mediastinum	04	5.3
Breast	04	5.3
Parotid	03	4.0
Parathyroid	02	2.7
Adrenal	02	2.7
Pancreas	01	1.3
Neck (Cyst)	01	1.3
Total	75	100

4) CYTOLOGICAL DIAGNOSIS IN INTRATHRACIC LESIONS

Cytological Diagnosis	No. of Cases
LUNG	
Squamous cell carcinoma	3
Adenocarcinoma	2
Tuberculosis	2
Lung Abscess	1
MEDIASTINUM	
Non Hodgkin's Lymphoma	2
Hodgkin's Lymphoma	1
Malignant round cell tumor, p/o NHL	1
TOTAL	12

5) CYTOLOGICAL DIAGNOSIS IN INTRAABDOMINAL LESIONS

Cytological Diagnosis	No. of Cases
GIT	
Adenocarcinoma	2
Metastatic Adenocarcinoma	1
Spindle cell tumor	1
Non Hodgkin's Lymphoma	1
LIVER	
Hepatocellular carcinoma	3
Tuberculosis	1
Metastatic carcinoma	1
Cholangio carcinoma	1
Cavernous hemangioma	1
GALL BLADDER	
Adenocarcinoma	5
PANCREAS	
Small round cell tumor	1
RETROPERITONIUM	
Epithelial neoplasm of ovary, serous type	2
Epithelial neoplasm of ovary, mucinous type 1	1
Metastatic carcinoma	1
Metastatic testicular seminoma(LN)	1
Benign spindal cell lesion	1
ADRENAL	
Metastatic carcinoma	1
Adreno cortical carcinoma	1
TOTAL	26

From Lymph node out of 15 cases, tuberculosis(6), metastatic adenocarcinoma(4), hodgkins lymphoma(2),metastatic squamous cell carcinoma(1),reactive lymphadenitis(1) & chronic non specific lymphadenitis(1) were diagnosed. In thyroid lesions due to hemorrhagic & scant aspirate on routine FNAC diagnosis were not possible so, USG guided FNAC was performed in 7 cases. Out of which Lymphocytic thyroiditis (2), Nodular goiter with cystic change (2), Papillary neoplasm (2) & Follicular neoplasm with cystic change(1) were diagnosed. From parathyroid lesion total 2 cases were of parathyroid adenoma. In 3 cases of parotid swelling due to cystic lesion & scant aspirate on routine FNAC diagnosis were not possible so, USG guided FNAC was performed & diagnosed as pleomorphic adenoma, cystic salivary lesion with atypia, &chronic sialadenitis. In 2 cases of breast lesions deep seated small lesion of less than 1 cm diameter & freely mobile swelling,So,USG guided FNAC was performed & diagnosed as fibroadenoma. In another two cases ductal carcinoma were diagnosed. From musculo-Skeletal lesions malignant lesion-(?)Cartilaginous origin, round cell tumor, metastatic carcinoma, cold abscess (vertebral) & acute suppurative inflammation were diagnosed.

COMPARATIVE ANALYSIS BETWEEN FNAC & HISTOPATHOLOGICAL EXAMINATION

FNAC RESULTS		HPE RESULTS	
FNAC	No. of patients	Benign lesions	Malignant lesions
Benign lesions	29	27(TN)	02(FN)
Malignant lesions	44	00(FP)	44(TP)
TOTAL	73	27	46

Accuracy= True Positive + True Negative/Total X 100 = **97.3%**

Sensitivity= True Positive/ True Positive+ False Negative X 100 = **95.7%**

Specificity= True Negative/ True Negative+ False Positive X 100 = **100%**

DISCUSSION

The main purpose of this study is to access the role of Image Guided FNAC in various lesions and correlate with histopathological findings. Image guided FNAC was performed in 75 patients and results of the FNAC were confirmed by Histopathological examination in 71 cases. In 2 cases, HPE diagnosis was not available because patients refused for biopsy. In 2 cases HPE diagnosis was different from the FNAC diagnosis. One case from lymph node was diagnosed as chronic non specific lymphadenitis on FNAC which was diagnosed as Non Hodgkin's lymphoma on HPE. In another case of thyroid FNAC diagnosis was

Nodular goiter with cystic change which turn out papillary carcinoma on HPE due to low cellularity & predominant benign component attached. Image guided FNAC has facilitated easy collection of cellular material with greater accuracy. ⁵ When the procedure is jointly done by a pathologist and the radiologist, the accuracy rate of obtaining a good sample is very high. The immediate assessment of the specimen by the on-site cytopathologist, along with further passes when necessary, improves the adequacy rate of the technique. ⁶ Therefore, Image Guided FNAC should be used as a routine procedure in the study of abdominal and thoracic lesions due to high sensitivity and specificity rate & very low complication rate. ⁷⁻¹⁰

Comparison of Image Guided Aspiration Cytology in various lesions from present study to other national and International studies. ¹¹⁻¹⁶

Studies	No. of cases	Sensitivity%	Specificity%	Accuracy%
Present study	73	95.7	100	97.3
Nidhi Mangal et al (Retroperitoneum)	85	94	100	96
Qureshi et al (Breast)	50	91.6	96.9	90
A. Martinek et al (Thyroid)	245	90	85	86
J.P.Singh et al (Transthoracic)	34	92.6	100	85.3
Ahmad SS et al (GIT)	86	93.8	100	94.4
S. Naqvi et al (salivary glands)	108	96.2	100	100

Our study was comparable with other author's study

CONCLUSION

Image guided FNAC has a pivotal role & is a cost effective tool for establishing tissue diagnosis as a primary investigative modality.

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