COMPARISON OF DIAGNOSTIC ACCURACY OF CORE BIOPSY FOR BREAST LESIONS WITH FINE NEEDLE ASPIRATION CYTOLOGY

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ABSTRACT

Objective: To assess and compare the diagnostic usefulness of fine needle aspiration cytology (FNAC) of trucut biopsy of breast lesion.

Study Design: A comparative cross sectional study.

Place and Duration of Study: The study was conducted in the surgical and pathology department of CMH Peshawar from February to August 2007.

Patients and Method: The first eighty two consenting female patients presenting with palpable breast lumps were subjected to FNAC then Trucut biopsy under local anaesthesia and later excision biopsy. Finally the results of FNAC and Trucut biopsy were compared in the light of excision biopsy results.

Results: There were 18 malignant and 64 benign cases on histopathology. On FNAC there were 5 in C5 category (confirmed on histopathology), 12 in C4 category (10 malignant on histopathology), 22 in C3 category (1 malignant on histopathology), 27 in C2 category (confirmed on histopathology) and 16 in C1 category (2 malignant on histopathology). On Trucut 60 were benign and 17 malignant all of which were confirmed on histopathology. Five specimens were inadequate on Trucut (1 malignant on histopathology). Sensitivities of FNAC and Trucut biopsy were 93.75 % and 100 % and specificities were 96 % and 100 % respectively. Area under Receiver Operating Characteristic (ROC) curve for Trucut biopsy was found to be more than that of FNAC, showing that Trucut biopsy was more accurate than FNAC.

Conclusion: Trucut biopsy has significantly higher diagnostic accuracy as compared to FNAC.

Keywords: Fine Needle Aspiration Cytology, Trucut Biopsy, Excisional Biopsy.

INTRODUCTION

A significant proportion of breast lumps are benign, it is the commonest presentation of carcinoma breast. Histopathological diagnosis of lump determines future management plan. Two modalities commonly used to obtain histological diagnosis are "Fine Needle Aspiration Cytology" (FNAC) and "Trucut Biopsy". In our setup almost all patients with palpable breast lumps are subjected to fine needle aspiration cytology and their further management is planned accordingly. But fine needle aspiration cytology can be inadequate or inconclusive in many cases i-e C1, C3 or C4 categories on FNAC [1].

These patients with inconclusive results are then subjected to excisional biopsy for diagnosis. Some of the studies however found core biopsy to have a higher diagnostic efficacy with sensitivity approaching 95 to 97 % as compared to FNAC with sensitivity upto 53 to 60 % [2, 3]. Other studies in contrast have found FNAC to be more sensitive (sensitivity: 90-97.5%) than Trucut biopsy (sensitivity: 67-90%), or equally sensitive [4]. Little comparisons in regards to these two diagnostic modalities have been made in our region, inspite of the fact that breast disease is very common among women of this area.

This study was carried out to define a better diagnostic approach for palpable breast lumps in our setup.

PATIENTS AND METHODS

Setting: The study was conducted at Surgical and Histopathology departments of Combined Military Hospital Peshawar.

Duration of Study: The study was conducted for six months from 16th February 2007– 16th August 2007.

Sample Size: A total of 82 female patients were included in the study. Their ages ranged from 13 to 80 years.

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Sampling Technique: Non-Probability Convenience Sampling.

Sample Selection

a. Inclusion Criteria: First 82 consenting females presenting in surgical OPD with palpable breast lumps were included in this study.

b. Exclusion Criteria: Patients with recurrent lumps after previous surgery were not included in this study.

Study Design: This was a comparative cross sectional study.

Data Collection Procedure: The first 82 consenting female patients were subjected to FNAC. Later they were subjected to Trucut biopsy under local anaesthesia followed by excision of the lump. The excised lump was sent for Histopathological evaluation, while the Trucut biopsy slides were prepared and collected for later evaluation. At the end of the study all the Trucut biopsy slides were code numbered so that the actual identity of the patient was not known to histopathologist. He was then given brief history of each patient but the results of FNAC and excision biopsy were not disclosed. Finally the diagnosis given by the histopathologist for each Trucut biopsy slide was compared to the same patient's FNAC and histopathology results.

Data Analysis Procedure: Data was analyzed using SPSS version 15. Descriptive statistics were used to describe the data. Diagnostic measurements were calculated for FNAC and Trucut biopsy (excluding C1/Inadequate results). Finally to compare the two tests, Receiver Operating Characteristic Curves [5, 6] were plotted and areas under ROC curves calculated for both FNAC and Trucut biopsy.

RESULTS

A total of 82 patients were included in the study (n = 82). Mean age of patients was 40 years. On histologic examination after excisional biopsies 64 were found to be benign and 18 of them were found to be malignant.

FNAC was C1 (inadequate) in 16 cases out of which 2 came out to be malignant on histopathology (1 Scirrhous Carcinoma and 1

Lobular Carcinoma) and 14 were benign. Twenty seven cases were in C2 (benign) category, later confirmed on histopathology. Twenty two cases were reported as C3 (Atypia) out of which one was found malignant on histopathology and the rest were benign on histopathology. There were 12 cases reported as C4 (Suspicious for malignant), out of these 2 were found to be benign on histopathology. Five cases were C5 (malignant), later confirmed on histopathology (Table 1).

In overall calculation of sensitivity/specificity of FNAC, C1 (inadequate) category was excluded. The overall sensitivity of FNAC came out to be 93.75 % and specificity was 96 % (Table 3).

On Trucut biopsy, 5 cases were inadequate, out of which 1 came out to be malignant and 4 were benign on histopathology. Sixty cases were reported as benign and 17 cases as malignant on Trucut biopsy which were all confirmed on histopathology (Table 2).

The inadequate biopsy cases were excluded in the final calculation of sensitivity and specificity as in the case of C1 category of FNAC. Thus the overall sensitivity of Trucut biopsy was 100 % and specificity was also 100% (Table 3).

Receiver Operating Characteristic (ROC) curves were plotted for both FNAC and Trucut biopsy (Figure 1 and 2) using the available data and area under ROC curves calculated. It came out to be 0.95 for FNAC and 1.00 for Trucut biopsy. This proves that the overall diagnostic accuracy of Trucut biopsy is higher than that of

Table-1: Sensitivities and Specificities of FNAC Categories

FNAC	Histopathology		
	Benign	Malignant	Total
C1	14	2	16
C2	27	0	27
C3	21	1	22
C4	2	10	12
C5	0	5	5
Total	64	18	82

Table-2: Sensitivities and Specificities of Trucut Categories

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| | Histopathology | | |
Trucut	Benign	Malignant	Total
inadequate	4	1	5
Benign	60	0	60
Malignant	0	17	17
Total	64	18	82

FNAC.

DISCUSSION

Accurate diagnosis of cancer has been a diagnostic dilemma since long. A differential diagnosis of the benign, traumatic and malignant lesions is very essential in early stages of the disease. It is extremely important that unnecessary surgeries or invasive treatment for benign diseases are minimized, and malignant lesions are managed

detection of malignant lesions. The important among them are the FNAC and Trucut biopsy.

Needle biopsy techniques are becoming popular as they are less invasive, less costly, and are also superior to frozen section as they provide the time to discuss with the patient different forms of treatment available [8, 9].

Both FNAC and Trucut biopsy are found to yield some percentage of false positive and false negative results. Their sensitivities, specificities and diagnostic accuracies have been calculated and analyzed by many. Unfortunately in Pakistan, only a few such studies have been done. The diagnostic accuracies of both these procedures are dependent on the operator performing the procedure, the cytopathologist and also on the type of lesion at hand.

In FNAC, sampling error (C1) is common if the lesion is small and also if there is vague thickening or nodularity. FNAC is also less ideal for certain type of breast carcinomas. For
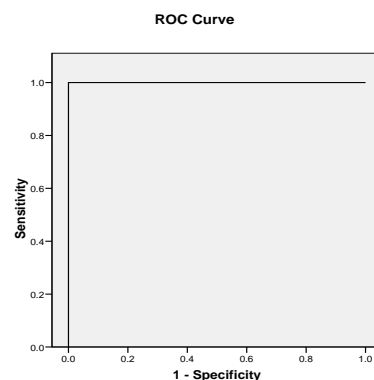
Table-3: Comparison of FNAC and Trucut Biopsy Results

	Sensitivity	Specificity	PPV	NPV	Diagnostic Accuracy
FNAC (n=66)	93.75%	96%	88.23%	97.96%	95.45%
Trucut (n=77)	100%	100%	100%	100%	100%
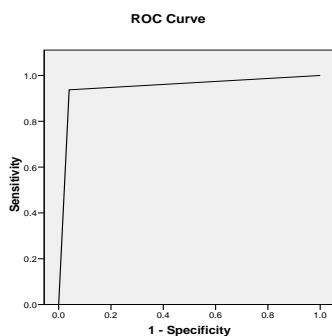
Area under the curve 0.95
Figure 1: Receiver Operating Characteristic Curve FNAC

Area under the curve 1.00
Figure 2: Receiver Operating Characteristic Curve Trucut

aggressively in early stages. The gold standard for a definitive diagnosis is the excision biopsy and histopathology [7]. Short of that there have been various diagnostic modalities claiming various sensitivities and specificities for the

example those associated with extensive fibrosis, intraductal carcinoma, tubular and cribriform carcinoma and, in general, very small tumours.

In most centres the specificity of FNAC is 92-97% [4]. In our study it came out to be 96%

which is comparable to other studies. This proves that a diagnosis of malignancy may generally be believed and definitive surgery may be planned without further biopsy.

The false negative rate for identifying breast malignancy, however, is high. In our study 6.25 % of malignancies were missed by FNAC. Sensitivity of FNAC in our study was 93.75% while in other studies the sensitivity ranges from 53-90% [2, 3]. Thus negative or inconclusive cytologic findings are not to be regarded as a definitive diagnosis especially if there is clinical suspicion of a malignant neoplasm.

In contrast to FNAC, Trucut biopsy removes a narrow cylinder of tissue that is submitted for both cytologic and architectural analysis of tissues. Consequently this technique has a higher diagnostic accuracy, sensitivity and specificity [10]. Some studies have found the sensitivity and specificity of Trucut biopsy as high as 92-97% and 94-100% [2-4]. This is comparable to our study, according to which sensitivity of Trucut biopsy is 100% and specificity is also 100%.

Sampling errors are also less common with Trucut biopsy. In our study, 10 % of trucut biopsies were inadequate as compared to 19.51% inadequate samples with FNAC. Other than these inadequate specimens the Trucut biopsy did not misdiagnose any benign or malignant pathology in this study. This is comparable to other studies which found the rate of samples reported as unsatisfactory by core biopsy to be less than that for FNA cytology (12.5% versus 34.2%) [11].

The diagnostic accuracy as interpreted by "Area under Receiver Operating Characteristic Curve" also confirms that Trucut biopsy is a more accurate test as compared to FNAC [5, 6].

CONCLUSION

It is concluded that for palpable breast lumps, Trucut biopsy has, statistically, significantly higher diagnostic accuracy as compared to FNAC. Thus in the diagnostic approach for palpable breast lumps Trucut biopsy should play a very major role especially in doubtful cases on FNAC.

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