

## The Role of Wide Bore Needle Biopsy In Establishing Confidential Diagnosis of Mammary Carcinoma

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### ABSTRACT:

#### BACKGROUND :

Fine-needle aspiration (FNA) is a rapid, safe, minimally invasive, and inexpensive way of diagnosing malignancy in women with palpable breast tumors.

This study was used the wide bore needle technique to obtain optimal results & can be used instead of core needle biopsy.

#### OBJECTIVE:

Fine-needle aspiration cytology is a rapid, safe, inexpensive and minimally invasive technique for diagnosis of breast malignancy. This study was an attempt to use wide bore needle instead of core needle biopsy to obtain optimal results.

#### METHOD:

Thirty five females with breast lumps underwent FNA aspiration cytology in the department of Al-Jamhuri Teaching Hospital in Mosul city. The study was achieved by using 19 gauged needle, part as routine cytology and other part as tissue block. Immunohistochemical stain for ER, PR and HER2 markers was performed on tissue blocks from 17 malignant cases.

#### RESULTS:

The cytology findings included 24 malignant cases (22 ductal carcinoma and 2 lobular carcinoma), 7 benign lesions and 4 suspicious cases. On the other hand, in tissue blocks the diagnosis of malignancy was given in 28 cases, 25 ductal carcinomas and 3 lobular carcinomas. Seven benign lesions, 6 were previously diagnosed as such by cytology and one suspicious case turned to be benign on wide bore needle. The four cytologically suspicious cases turned to be malignant in 3 cases and benign fibrocystic changes in the fourth case. Immunohistochemical analysis including ER, PR and HER-2 on seventeen cases of breast carcinomas. Seven out of 17 were shown positivity for ER while 3 cases were PR positive and Her2-neu was positive in 12 cases.

#### CONCLUSION:

It is preferred to use wide bore needle in the diagnosis of breast lesions to obtain more tissue material and optimal results. As well, to a certain extent the wide bore needle might substitute the core needle biopsy for diagnosis and immunohistochemical assessment because the latter is rather expensive and, at time is not available in our laboratories now.

**KEY WORDS:** breast lesion, wide bore needle, core needle biopsy.

### INTRODUCTION:

Fine needle aspiration (FNA) is rapid, safe, minimally invasive and cost effective procedure<sup>(1)</sup>. It is considered the first line in the screening program for pathological evaluation of abnormal radiologic imaged breast lumps<sup>(2)</sup>.

Fine-needle aspiration (FNA) of the breast, although is effective in the diagnosis of breast carcinomas, a minority of cases cannot be classified as benign or malignant. Such cases are usually assigned as inconclusive for diagnosis and often prompting surgical intervention, and despite surgery is justified in some cases, many

lesions are proved to be benign. If these inconclusive FNAs could be accurately categorized as benign or malignant, considerable number of patients might avoid unnecessary surgery<sup>(2)</sup>. As well, the more cytologically obtained material, the more satisfactory will be the diagnostic results. Accordingly, utilizing wide bore needle gauge 19 (G-19) aids in minimizing the percentage of cytological breast mass reports of suspicious (C3, C4) categories according to NHSBSP (UK), 2001 and European Guidelines for cytological diagnosis and reporting.<sup>(3,4)</sup>

The accuracy of FNA is different among different centers with a range of 95-100%<sup>(5)</sup>. This range is

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influenced by many factors such as, the experience of the aspirator or cytopathologist and the palpability of the lesion <sup>(6)</sup>.

To provide a larger samples for tissue diagnosis and highly accurate results especially for clinically impalpable breast lesions by using 14-gauge wide bore needle (core needle biopsy) since 1990s, which However compared with FNA, biopsy has several drawbacks like higher cost, patient discomfort; delay in the availability of results, greater distortion of the area by hemorrhage and the risk of tumor implantation in the core biopsy tracking <sup>(7)</sup>.

Moreover immunocytochemistry, like ER, PR, P53, bcl-2 and Ki 67 growth fraction, can be performed on FNA material. This immunohistochemical application can provide information about the tumor during different stages of diagnosis and treatment of cancer especially for elderly patient who can't tolerate surgery, and may provide useful indication for immunologic, endocrine and/or chemotherapy <sup>(8)</sup>. Nevertheless, HER-2 protein expression on direct cytological preparation is insufficiently reliable for clinical use <sup>(9)</sup>.

#### MATERIAL AND METHODS:

During a period of one year (June 2010-May 2011), 35 females with suspicious breast lumps underwent FNA in the department of cytology at Al-Jumhuri Teaching Hospital, Mosul-Iraq, by using 19 gauge needle. One portion of aspirate material was spread directly on slides, fixed immediately with 95% alcohol for cytologic examination stained by Hematoxylin & Eosin . The residual material was put in a funnel of filter paper, fixed in formalin, embedded in paraffin and processed routinely, sections were stained with the routine H&E stain sections, the immunohistochemical Assessment of hormonal markers (Estrogen and Progesterone receptors)

and HER2neu status were performed on only 17 cases with diagnosis of breast carcinomas. Paraffin tissue sections are incubated at 60 °C for 16 hours, clearing and dehydration, antigen retrieved and then incubated with tested primary antibodies (ER,  $\alpha$  clone 1D5, Dako-Denmark; PR, clone PgR 636, Dako-Carpenteria USA; HER2/neu, Dako-Denmark). Allred scoring system was used to assess the nuclear reactivity of cancer cells for ER and PR, whereas HER2/neu was assessed using the recent ASCO/CAP scoring guideline recommendation <sup>(10)</sup>.

#### RESULTS:

From the FNA readings, there were 24 malignant cases (22 ductal carcinomas and 2 lobular carcinomas), 7 benign lesions and 4 suspicious (i.e abnormal cells that are almost certainly malignant but either are too scanty or show incomplete criteria for an unequivocal diagnosis of malignancy), Table1.

Whereas the tissue block results comprised 28 malignancies (25 ductal carcinomas and 3 lobular carcinomas) and 7 benign lesions. The 4 suspicious FNAC readings turned to be invasive carcinoma in 3 cases (2 ductal and 1 lobular) and benign fibrocystic changes in the fourth one (Table 2). Only one FNA benign lesion turned to be invasive ductal carcinoma. The overall accuracy rate of FNAC as compared with tissue blocks of the same aspirated materials was 93% with a sensitivity of 95% and a specificity of 86%.

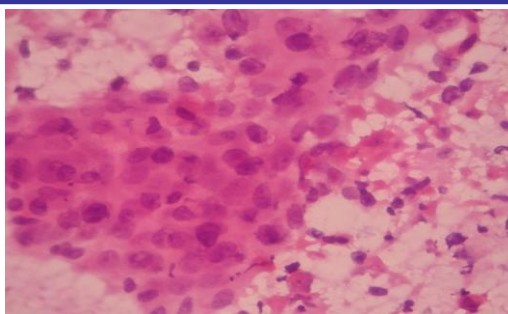
Out of 17 cases with a proven diagnosis of malignancy, seven were positive for ER. PR was positive only in 3 cases while 12 cases were HER-2neu positive. Two cases out of 17 were positive for both ER/PR and two cases show triple negative for ER,PR and Her2-neu.

**Table 1: Findings of FNA cytology (FNAC) and cell block preparation (FNTB).**

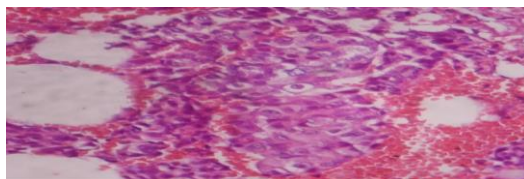
| Diagnosis         | No. of cases diagnosed by (FNAC) | No. of cases diagnosed (FNTB) |
|-------------------|----------------------------------|-------------------------------|
| Ductal carcinoma  | 22 (62.85%)                      | 25 (71.42%)                   |
| Lobular carcinoma | 2 (5.71%)                        | 3 (8.57%)                     |
| Benign lesions    | 7 (20%)                          | 7 (20%)                       |
| suspicious        | 4 (11.42%)                       | 00                            |
| Total             | 35 (100%)                        | 35 (100%)                     |

**Table 2: Results of the suspicious cases on FNAC.**

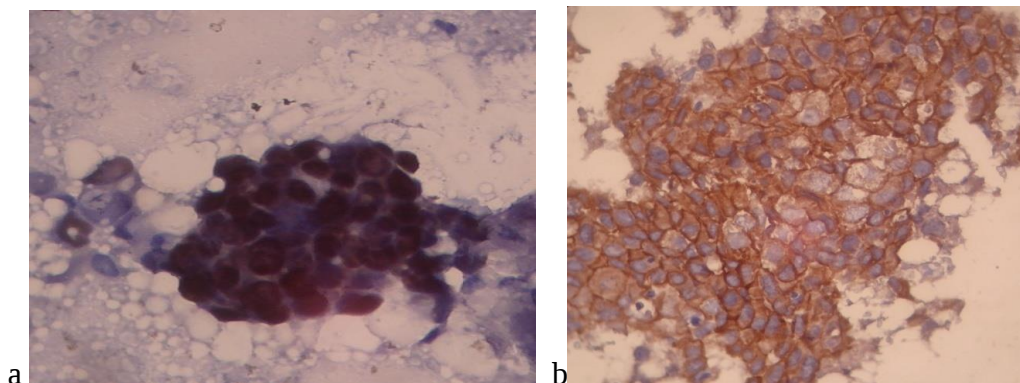
| No. of cases/ no. of suspicious case | Diagnosis by FNTB            |
|--------------------------------------|------------------------------|
| 2/4 (50%)                            | Invasive ductal carcinoma    |
| 1/4 (25%)                            | Invasive lobular carcinoma   |
| 1/4 (25%)                            | Benign (fibrocystic changes) |



**Figure 1: FNAC Breast :Invasive ductal carcinoma (H&E stain, 400X).**



**Figure 2: Breast biopsy (tissue block) :Invasive ductal carcinoma (H&E stain, 400X).**



**Figure 3: Invasive ductal carcinoma (a) strong positivity for ER (b) strong HER 2/neu positivity (Tissue block IHC 400X)**

## DISCUSSION:

Fine-needle aspiration (FNA) biopsy of palpable breast masses along with clinical and radiologic findings can provide rapid distinction between benign and malignant lesions. In this study, was attempted to determine whether a malignant cytologic diagnosis for palpable breast mass is sufficient for its definitive surgical management as an invasive neoplasm <sup>(11)</sup>, which might be achieved by obtaining more tissue by using wide bore needle especially to confirm diagnosis of malignant breast lesions.

The diagnostic accuracy of needle core biopsy (NCB) has been intensely verified and several studies have shown good concordance between NCB and subsequent surgical excision biopsy for diagnosis of carcinoma (ranging from 91% to 100%) <sup>(12)</sup>. In this study, the accuracy of wide bore needle was comparable with that of other studies( 93% )

Wide bore needle biopsy has a benefit of getting copious tissue fragments essential for primary diagnosis as well as utilizing material in immunohistochemical techniques, as proved in present study. Subclassification of all 35 cases, in particular the 25 cases of invasive carcinomas, was achieved by FNAC as clarified in some literatures <sup>(13)</sup>.

Obtaining a definite preoperative diagnosis in patients with breast lumps offers several advantages to the patient, the surgeon and the pathologist. False-positive cytologic diagnoses of benign breast lesions are extremely rare and represented in 0.6% of cases or less <sup>(14)</sup>. To avoid false-positive diagnoses, several authors have

**133** and a stratified diagnostic approach in cases with any degree of uncertainty are

classified in a "probable" category, which does not indicate definitive therapy <sup>(14)</sup> In the present study, using 19-gauge needles there was no false positive results, however we observed false negative diagnosis in only one case (3.5%) and 85.7% accuracy in the diagnosis of cancer. Similarly using a 19-gauge Surecut needle, Watt-Boolsen et al reported 65% positive rate in diagnosis of invasive breast cancer. In contrast, Alfonso et al demonstrated no false-positive and a correct histologic diagnosis of malignancy was achieved in 93% of the patients. Nevertheless, still there is a debate about superiority of tru-cut needles compared with gauge 19 needle cytology <sup>(15,16)</sup>. The rate of false negative results can be reduced by obtaining more tissue with wide bore needles, but a matter of fact, cytological diagnosis must be correlated with clinical and imaging findings (triple tests) for perfect results <sup>(17)</sup>. In addition, still authors face a challenge to differentiate between benign and low grade malignant lesions, as seen in present study among 4 suspicious cases; on tissue block, one case was proved to be non-neoplastic while the remainders turned to be malignant. Most aspirates yield suspicious findings on cytological examination proved to be malignant as far as three out four suspicious evidenced in this work <sup>(17)</sup>. Although the majority of breast aspirates can be readily classified as benign and malignant some aspirates yield equivocal cytologic findings and may require further investigations <sup>(18)</sup>.

The possibility of obtaining information about hormonal and Her2-neu status at time of diagnosis may be particularly relevant to breast carcinoma patients treated with the primary systemic therapy. In these cases, as treatment is instituted prior to surgical resection, the knowledge of the biologic characteristics of the tumor could provide prognostic and predictive information <sup>(8)</sup>. The immunohistochemical results of hormones in this study were in agreement with other studies were done on tissue block however, this study was shown higher results for Her-2 neu than these studies (19,20) this bias in results could be related to small sample size in the current study.

### CONCLUSION:

It is preferred to use wide bore needle to obtain tissue material and to get optimal results. As well, to a certain extent the wide bore needle might substitute the core needle biopsy for

diagnosis and immunohistochemical assessment because the latter is rather expensive and, at time not, available in our laboratories.

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## DIAGNOSIS OF MAMMARY CARCINOMA

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