

## Comparison of Fine Needle Aspiration Cytology (FNAC) and Trucut biopsy in evaluation of suspicious palpable breast lesions

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**Objective:** To evaluate the direct comparison of Fine Needle Aspiration Cytology (FNAC) with tru-cut breast biopsy in palpable suspicious breast lesions.

**Methodology:** This study was conducted in surgical unit Hayatabad Medical Complex, Peshawar, Pakistan from January 2012 to December 2013. All female patients of age above 20 years with clinically palpable lump were included in the study. Both FNAC and tru-cut biopsy were performed simultaneously in the same setting and the results were compared with final histopathology as gold standard.

**Results:** A total of 65 patients were evaluated. Mean age of the patients was  $39.33 \pm 13.52$

years. The overall sensitivity of FNAC was 94.9% and that of the tru-cut biopsy 100%. The specificity for malignancy was 88.2% and 93.5% for FNAC and tru-cut biopsy, respectively.

**Conclusion:** Although FNAC is a useful and rapid method for evaluating any palpable breast lump, tru-cut biopsy was more sensitive and specific. Tru-cut biopsy had potential benefits for histological diagnosis and information about tumor type, grade, receptor status and use of any neo-adjuvant therapy for breast lesion. (Rawal Med J 2014;41:205-208).

**Key words:** Fine needle aspiration cytology (FNAC), tru-cut biopsy, breast lumps.

### INTRODUCTION

Among women, breast lump is the most common presenting symptom to an outpatient clinic because of considerable anxiety to both patients and their families about the carcinoma breast.<sup>1</sup> It is sometimes difficult to differentiate benign lesions from malignant simply on clinical basis.<sup>2</sup> Both FNAC and tru-cut biopsy are screening modalities used for the diagnosis of breast cancer. Early diagnosis of the breast carcinoma is important in order to improve the survival rate.<sup>3</sup> With combination of clinical examination, imaging and FNAC, a definitive diagnosis can be made in about 95% of the cases.<sup>4</sup> Triple assessment has a sensitivity of 99.6% and a specificity of 93%.<sup>5</sup>

FNAC was first introduced in 1930 for the evaluation of palpable breast lesions, and since then used widely for this purpose.<sup>6</sup> Because of its high diagnostic sensitivity and specificity, FNAC has decreased the needs for open biopsies. Because of its decreased complications, cost effectiveness and early result availability, FNAC has been used as an initial and first line diagnostic tool for breast lump but needs high operator experience.<sup>7</sup> However, the disadvantage of FNAC is that it still has percentage

of uncertainty, cannot tell about the histological type, grade and receptor status of the tumor which are important pre operatively for both the surgeons and oncologist.<sup>8</sup> The sensitivity of FNAC is 80-98% and specificity of more than 99-100%.<sup>4</sup>

Tru-cut biopsy have higher sensitivity, specificity, positive predictive value and low false negative rates as compared to FNAC especially in lesions not definitely benign or malignant.<sup>9</sup> Tru-cut biopsy provides important information's regarding tumor grade and type.<sup>10</sup> The overall sensitivity of FNAC, tru-cut and frozen section reaches 75%, 92-94% and 100% respectively in one study.<sup>3</sup> The aim of this study was to correlate the FNAC findings of suspicious breast lumps in patients with their tru-cut breast biopsy findings in our hospital.

### METHODOLOGY

The study included 65 consecutive females with palpable breast lump seen at surgical out-patient department of Hayatabad Medical Complex, Peshawar, Pakistan from January 2012 to December 2013. All females of above 20 years with palpable breast lumps were included in the study. Males, impalpable lumps, recurrent malignancy, age less

than 20 years and not consented for study were excluded. A written informed consent was taken from all patients. After detailed history, clinical examination and mammography in indicated patients (> 35 years), all underwent FNAC and tru-cut biopsy simultaneously. FNAC was performed by histopathologist and tru-cut biopsy was performed by an experienced surgeon. The slides of FNAC and tru-cut biopsy were evaluated by two different histopathologists to minimize the bias risk. Later on all of them had excision biopsy of the lump or mastectomy for final confirmation of diagnosis. The results of both procedures were tabulated and sensitivity were calculated and compared.

FNAC was done using disposable syringe with 21-23 gauge needle without local anesthetic under aseptic technique. Tru-cut biopsy was done with 14-16 gauge needles under local anesthesia around the lesions. Cytology reporting was based on the following NHS guidelines.<sup>11</sup> C1=Not representative of the lesion, C2=benign, C3=borderline benign, C4=suspicious for malignancy and C5=malignant.

**RESULTS**

In this study 65 female patients underwent FNAC and tru-cut biopsy simultaneously. Mean age was 39.33±13.52 years. Left breast was involved in 38 (58.5%) and right in 27 (41.5%) cases, respectively. The most frequent site involved was upper outer quadrant in 38(58.5%) patients, central in 17 (26.1%), lower inner in 6 (9.2%), upper inner in 4 (6.1%), respectively.

Most cytology reports were in C-2 category (Table 1). FNAC diagnosed breast cancer in 20 patients and four cases one of benign phyllodes tumor, one atypical epithelial hyperplasia and two giant fibroadenoma were reported false positive. Three cases of invasive ductal carcinomas were reported false negative. Fibroadenomas were diagnosed in 24 cases, 22 confirmed on biopsy and one found out to be phyllodes tumor and epithelial hyperplasia each (false positive). Out of sixty five lesions fifty six were diagnosed correctly on FNAC with 94.9% sensitivity and specificity for malignancy is 88.2% (Table 2).

**Table 1. FNAC Analysis.**

Cytology report	Number	Percent
C-1	6	9.2
C-2	34	52.4
C-3	5	7.7
C-4	16	24.6
C-5	4	6.1

**Table 2. Results of FNAC.**

FNAC diagnosis	No=65	Final histopathology	False +ve	False -ve
Benign	21	Fibroadenoma-11 Phyllodes tumor- 3 Epithelial hyperplasia-4 Ductal cancer-3	-	03
Fibroadenoma	24	Fibroadenoma-22 Phyllodes tumor-1 Epithelial hyperplasia-1	02	-
Ductal cancer	4	Ductal Cancer-4	-	-
Malignant	16	Ductal Cancer-10 Lobular Cancer-2 Phyllodes tumor-1 Epithelial hyperplasia-1 Giant fibroadenoma-2	04	-

**Table 3. Results of Tru-cut biopsy.**

Trucut diagnosis	N0=65	Final histopathology	False +ve	False -ve
Benign	9	Phylloides-2 Epithelial hyperplasia-5 Fibroadenoma-2	-	-
Fibroadenoma	32	Fibroadenoma-32	-	-
Phylloides	2	Phylloides-2	-	-
Ductal cancer	15	Ductal cancer-15	-	-
Malignant	7	Ductal cancer-2 Lobular cancer-2 Atypical epithelial hyperplasia-1 Phylloides-1 Giant Fibroadenoma-1	03	-

Trucut biopsy diagnosed the carcinoma in 22 patients. Invasive ductal carcinoma was diagnosed correctly in 15 cases. Seven cases which were only reported malignant on tru-cut, came out to be invasive ductal carcinoma in 2 cases, lobular carcinoma in 2 cases and each case of benign phylloides tumor, atypical epithelial hyperplasia and giant fibroadenoma were false positive. Thirty two cases of fibroadenomas diagnosed on tru-cut were confirmed accurate on biopsy. Sensitivity calculated is 100% with sixty two out of sixty five

lesions were reported accurately with no false negative result and specificity for malignancy is 93.5% (Table 3). The overall sensitivity of FNAC in our study was 94.9% and that of the trucut biopsy 100% and specificity for malignancy was 88.2% and 93.5% for FNAC and tru-cut biopsy, respectively.

## DISCUSSION

In our study, FNAC and trucut biopsy were performed on the same lesion and the operator dependence has been standardized. The FNAC is an excellent method for diagnosing palpable lesions its sensitivity has been reported to be between 89% and 98%<sup>16</sup> and its specificity between 98% and 100%.<sup>12</sup> People used to undergo excision biopsy of fibroadenoma to remove the tumor and establish diagnosis. Now tru-cut biopsy is widely used and lesion is left undisturbed in the breast if the diagnosis is fibroadenoma. Fibroadenoma was the most common histopathological diagnosis and comprised 53.8% of the total cases. In our study, 35 cases of fibroadenomas were reported on histopathology, of them 32 were correctly diagnosed on Tru-cut biopsy reflecting the high accuracy of trucut biopsy (Table 3).

We found malignancy in 19 cases on histopathology. Out of these, FNAC and Trucut biopsies accurately showed invasive ductal carcinoma in 4(6.1%) and 15(23%) cases, respectively. In FNAC and Trucut biopsies, the remaining 12(18.5%) and 4 (6.1%) cases were reported as malignant (Table 2 and 3). Out of 21 benign lesions on FNAC, 3 cases were confirmed as invasive ductal cancer on histopathology (Table 2). In our study, we found that 21% and 79% of carcinoma were diagnosed with tumor type by FNAC and trucut biopsy, respectively as compared to 20% and 73% in one study.<sup>13</sup>

Phyllodes tumor has a 20% to 40% local recurrence rate and if malignant may cause distant metastasis.<sup>14</sup> Two out of five phylloides tumors in our study were diagnosed accurately on Tru-cut biopsy. The other three were reported as two benign and one malignant. FNAC failed to diagnose any of the phylloides tumors and reported three as benign lesions, one fibroadenoma and one as malignant.

A total of 6(9.2%) cases of epithelial hyperplasia were confirmed on histopathology as compared to 4% in one study.<sup>13</sup> Epithelial hyperplasia was diagnosed as a benign lesion both on FNAC and Trucut biopsy in 4(6.1%) and 5(7.7%) cases, respectively in our study. Although it is a benign condition but in women with palpable cysts, complex fibroadenomas, duct papillomas, sclerosis adenosis, and moderate or florid epithelial hyperplasia have a slightly higher risk of breast cancer (1.5-3 times) than women without these changes.<sup>15</sup>

The overall sensitivity of FNAC in our study was 94.9% and that of the trucut biopsy 100%. The sensitivity of FNAC and Trucut was reported 88% and 96% in one study,<sup>13</sup> comparable to our study. In another study<sup>16</sup> sensitivity of FNAC and trucut biopsy was reported as 81.4% and 91.5%, which is also comparable to our study. The FNAC sensitivity of 94.9% in our study was also comparable to other studies.<sup>17-19</sup> The 100% sensitivity of trucut biopsy in our study is comparable to trucut biopsies in studies done by Loffeet al<sup>20</sup> and Memonet al<sup>21</sup> with sensitivities of 96.7% and 100%, respectively. The specificity of FNAC and tru-cut for malignancy was 88.2% and 93.5% in our study, comparable to specificity of FNAC (100%) and trucut biopsy (100%) in one study.<sup>4,22,23</sup>

## CONCLUSION

Although FNAC is a useful and rapid method for evaluating any palpable breast lump, however trucut biopsy is more sensitive and has potential benefits for breast lump histological diagnosis and information about tumor type, grade, receptor status and use of any neo-adjuvant therapy for breast lesion.

### Author Contributions:

Conception and design: Yousaf Jan, Muhammad Shah  
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