Original Article

A comparison of ultrasound guided fine needle aspiration cytology and core needle biopsy in evaluation of palpable breast lesions

Humera Naz Altaf, Fareeha Farooqui

Department of Surgery, Holy Family Hospital, Rawalpindi, Pakistan

Objective: To compare ultrasound guided fine-needle aspiration cytology (FNAC) and core needle biopsy (CNB) in patients presenting with palpable breast lumps (PBLs), in terms of sensitivity and specificity, taking final histopathology as gold standard.

Methodology: This cross-sectional study was conducted at Holy Family Hospital, Rawalpindi, Pakistan. Ultrasound guided FNAC and CNB were taken of all female patients with PBLs. The results were compared with final histopathology as gold standard. Data analysis was performed using SPSS software and chi-square test.

Results: A total of 60 patients were included in the study. The mean age was 33.8 yrs. The sensitivity and specificity of ultrasound guided FNAC were 68.7% and 93.1%, respectively. The sensitivity and specificity of ultrasound guided CNB was 93.7% and 100%. The accuracy of FNAC was 86.2% and that of core needle biopsy was 98.3%.

Conclusion: The ultrasound guided core needle biopsy can be used as an initial diagnostic test for the evaluation of all PBLs. Because of high negative predictive value core needle biopsy can replace surgical excision biopsy for benign lesions. (Rawal Med J 201;40:392-395).

Key words: Breast lump, breast cancer, FNAC, core needle biopsy.

INTRODUCTION

Breast lump is one of the most common reasons for which women seek medical advice as it causes a lot of apprehension and anxiety to the patient as well as to the family.[1] Though most of these are benign lumps but still to alleviate the fear of malignancy, histopathological confirmation is necessary.[2] By 1992, after introduction of National Health Service Breast Screening Programme (NHSBSP) as many as 62% of breast cancer patients were diagnosed by needle biopsies only and there was a great reduction in open biopsy rate.[3,4] With the evolution of image guided biopsies, the rate of open biopsies has even fallen to negligible, and it made a dramatic change in patient management.[5] Ultrasound guided biopsies are now a days the recommended part of triple assessment, especially in borderline and calcified lesions. Surgeons have been doing CNB of palpable masses with out image guidance for histological diagnosis. The accuracy of CNB is increased with image guidance because ultrasound can guide the biopsy needle to areas of lump more suitable for biopsy resulting in less incidences of inadequate sampling, avoiding the core of the lump which can sometimes be necrotic and gives inadequate samplesMoreover, it is safe, cost effective and highly accurate as compared to other stereotactic techniques.[6]

FNAC has been widely accepted as a first line diagnostic procedure for patients with breast lesions as it is associated with decreased complications and results can be obtained within few hours, at the same time it requires experienced cytopathologists.[7] Problem arises in borderline cases where tissue diagnosis is required for further management and so as to decide whether to manage patient conservatively or proceed with definitive management in form of excision biopsy or mastectomy. Thus, there is need for repeat FNAC or a tissue biopsy like core needle biopsy (CNB) to reach a diagnosis.[8] In comparison to ultrasound guided FNAC, CNB techniques have significantly higher sensitivity, specificity and positive predictive value and lower false negative rate, especially in those lesions that were not definitively benign or malignant and calcified.[9] Our study aimed at comparing the two diagnostic modalities used for pathological diagnosis of breast lumps in our set up so as to assess their cost effectiveness as a first line diagnostic test for palpable breast lumps in our set up.

METHODOLOGY

From February 2009 to January 2012, patients with palpable breast lumps (PBLs) presenting to the breast clinic at Holy Family Hospital, Rawalpindi, Pakistan were included in the study by convenience sampling. Patients with breast cysts detected on

ultrasound were excluded from the study. An Informed consent was taken. All patients underwent FNAC and CNB as outpatient procedure. For FNAC, a 10cc syringe with 22 gauge needle was used. In the same setting, core samples were obtained from each lump with use of 14 gauge core biopsy needle. According to standard protocol, at least three to four core samples were routinely obtained.

The slides for FNAC and CNB samples were evaluated by two different histopathologists so as to minimize the risk of bias. The results of FNAC were interpreted as C1-C5, granulomatous inflammation and benign phyllodies tumor. The patients were scheduled to visit breast clinic approximately five days after the procedures for definite pathology report and counseling on further management and were examined for any complications as bleeding or infections. All patients after FNAC and core needle biopsy underwent definitive treatment in the form of surgical excision of lump or mastectomy.

Statistical Analysis of the data was done using SPSS 14.0. The diagnostic sensitivity, specificity accuracy and positive predictive value and negative predictive value were computed for ultrasound guided FNAC and CNB for palpable breast lumps. Histopathology was taken as gold standard.

RESULTS

Out of 60 patients, 33 women (55%) were younger than 30 years, 18 women (30%) were between the 30 and 49 years old, and 11 women (18.3%) were 50 years old or older. The age ranged from 16 to 72, (mean 33.6 yrs). No complications were noted for both FNAC and CNB.

Table 1. Descriptive statistic for ultrasound guided FNAC (N=60).

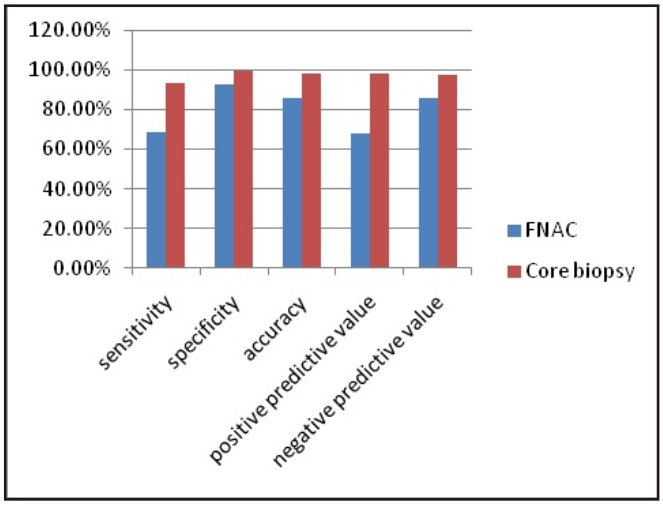
Cytology report	Number	Percent
C-1	4	6.7
C-2	30	50.0
C-3	8	13.3
C-4	5	8.3
C-5	9	15.0
Granulomatous Inflammation	3	5.0
Benign Phylloides	1	1.7
Total	60	100.0

Most cytology reports were in C-2 category (Table 1). Most common histological diagnosis was fibroadenoma and infiltrating ductal carcinoma (Table 2).

Table 2. Descriptive statistics for ultrasound guided core needle biopsy (N=60).

Histopathology Report	Number	Percent
Ductal Carcinoma In Situ	2	3.3
Infiltrating Ductal Carcinoma	11	18.3
Infiltrating Lobular Carcinoma	2	3.3
Granulomatous Inflammation	3	5.0
Fibroadenomas	32	53.3
Fibrocystic Disease	7	11.7
Mastitis	2	3.3
Inadequate	1	1.7
Total	60	100.0

Fig. 1. Sensitivity, specificity, positive and negative predictive value of ultrasound guided FNAC and core needle biopsy.



The mean size of the masses was 3.8cm (range 2cm 7.2cm). The results sensitivity, specificity, positive and negative predictive values are shown in Fig 1.

DISCUSSION

Open surgical biopsy is the "gold standard" method of evaluating a suspicious breast lesion,[10] which, like all surgeries, places the patient at risk of experiencing morbidities and in rare cases,

mortality.[11] Only 20 to 30 percent of women who undergo breast biopsy are diagnosed with cancer.[12] So, exposing large numbers of women who do not have cancer to invasive surgical procedures may be considered an undesirable medical practice. A less invasive method for evaluation of suspicious breast lesions should therefore be preferable if it is sufficiently accurate and cost effective as well.

Our study examined the outcomes of ultrasound guided CNB and FNAC ascertained with surgical histology. The local data is deficient in comparison of the two diagnostic tests in palpable lumps; there is one study by Ahmed et al on non palpable lesions but no study on palpable lesions.[13] Moreover, in our study we performed both of these tests on the same patient; thus our study reported direct comparisons of the two tests. Although FNAC performed well (except for relatively high inadequacy), CNB had significantly better performance based on measures of sensitivity, specificity and accuracy.

Overall, ultrasound guided CNB is the more reliable biopsy method for PBLs; specially where first time FNAC is inadequate or inconclusive or lesions are borderline or clinical and imaging features are more in favor of a malignant lump so that tumor grading and checking for hormone receptor can be performed in the same sample thus making it cost effective, time saving and also saving patient from repeat procedures. This would also be helpful in advanced breast carcinomas, which are quiet common in this part of the world, where neo-adjuvant chemo and hormonal therapy can be started on the basis of ultrasound guided CNB rather than FNAC.[14-16] Our results are comparable with lot of other national and international studies performed in different settings.[17-21]

With the evolution of new diagnostic modalities as image guided biopsies, which by direct visualization of the tumor, minimize the frequency of getting negative, a-cellular biopsies, tissue from normal breast parenchyma and necrotic material.[5,7] Thus, ultrasound guided biopsies have actually minimized the open biopsies and unnecessary excision biopsies of benign lumps, which can be easily managed conservatively. Our study demonstrates that ultrasound guided CNB is more accurate and with high negative predictive value so can be helpful in our setup for suspicious lesions so as to save patient's money, time and saving patient from repeat biopsies. More over, in advanced malignancies definitive chemotherapy can be started on its basis without requiring experienced cytopathologists. Our study has the limitations as number of patients was very small and most of the lesions were benign. Further studies can be conducted including larger number of patients with suspicious or borderline lesions so that more accurate results are achieved.

CONCLUSION

Core needle biopsy can be used as an initial diagnostic test for the evaluation of all clinically suspicious palpable breast lumps. Open surgical biopsies can be avoided in patients in whom radiological and histopathological findings provide a diagnosis of benign breast lumps.

Author Contributions:
Conception and design: Humera Naz Altaf
Collection and assembly of data: Humera Naz Altaf
Analysis and interpretation of the data: Humera Naz Altaf, Fareeha Farooqui
Drafting of the article: Humera Naz Altaf
Critical revision of the article for important intellectual content: Humera Naz Altaf
Statistical expertise: Humera Naz Altaf
Final approval and guarantor of the article: Humera Naz Altaf, Fareeha Farooqui
Corresponding author email: Dr Fareeha Farooqui (drfareeha_f@hotmail.com)
Conflict of Interest: None declared. Present address: Shifa College of Medicine, Islamabad, Pakistan
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