

The role of Tru-cut needle biopsy in the diagnosis of palpable breast masses

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Summary:

Background: Breast Lump Is The Second Most Common Presenting Symptom, After Breast Pain, To The Breast Clinic. Tru-Cut Needle Biopsy Provides Enough Tissue For Histopathological Diagnosis And Is Considered A Reliable Method For Establishing Preoperative Tissue Diagnosis.

Objectives: To Compare The Results Of Fine Needle Aspiration Cytology (FNAC), Tru-Cut Needle Biopsy With Excisional Biopsy In Detecting Breast Cancer In Palpable Breast Masses.

Patients and Methods: This Is A Prospective Study Done In Baghdad Teaching Hospital Breast Clinic From January 2009 To October 2010. It Is Conducted On 120 Females Who Presented With Palpable Breast Masses. After Detailed History And Physical Examination The Patients Were Sent For Ultrasound Examination And/Or Mammography And Then Both FNAC And Tru-Cut Needle Biopsy Were Performed In An Outpatient Setting Followed By Excisional Biopsy.

Results: This Study Shows That Tru-Cut Needle Biopsy Is Superior To FNAC In Confirming Breast Cancer In Palpable Breast Masses With Suspicion Of Malignancy And It Can Give Definitive Histopathological Diagnosis Of The Lesion With Low Cost And Low Complication Rate.

Conclusion: Tru-Cut Needle Biopsy Is Superior To Fine Needle Aspiration Cytology In The Detection Of Breast Cancer In Palpable Breast Masses With Low Cost And Low Complication Rate.

Key Words: Tru-Cut Needle Biopsy, Breast Mass.

J Fac Med Baghdad
2014; Vol.56, No. 3
Received May.2013
Accepted Jun. 2014

Introduction:

Breast cancer is a major and important malignant disease throughout the world. During the second half of the twentieth century there has been a massive increase in the recorded incidence of breast cancer(1). In any patient who presents with a breast lump or other symptoms suspicious of carcinoma, the diagnosis should be made by a combination of clinical assessment, radiological imaging and a tissue sample taken for either cytological or histological analysis, the so called triple assessment (2). Fine needle aspiration cytology (FNAC) of breast lumps is an important part of the triple assessment(3, 4). It is an accepted and established method to determine the nature of the lump (5), It can reduce the number of open breast biopsy(6) and has been found to have high sensitivity and specificity in most studies(7). It is now considered by many authorities to be an essential prerequisite for any breast clinic (8). However, FNAC does have some limitations. Optimal results necessitate the availability of a trained and committed cytologist and the technique demands experience (9). Tru-cut biopsy of palpable breast lesions can provide all the reliable information to guide the surgeon and the oncologist to plan an ideal therapeutic strategy in surgical decision making (10). And permits the eventual use of neoadjuvant therapy. (11) On the other hand excisional biopsy would provide the

pathologist with the whole breast lesion and allows him or her to examine its histopathological type, grade and degree of differentiation of the carcinoma if present. Also receptor status for estrogen, progesterone and tyrosine kinas Her2(C erb b2) can be assessed. However, it mostly requires general anesthesia(12, 13).

Patients and methods:

This is a prospective study done in Baghdad teaching hospital breast clinic over the period from January 2009 to October 2010. The study involved 120 women presented with palpable breast lumps of variable sizes from 1cm to 5cm or occasionally larger. Clinical assessments were done then the patients were sent for mammography and/or ultrasound examination. All the patients underwent FNAC, Tru-cut biopsy and then excisional biopsy.

Fine needle aspiration is performed using 22-23 gauge needle attached to a 10 ml syringe. A 2ml of air is aspirated before inserting the needle into the mass, this is to expel the cellular material at the hub at the end of the procedure, then the needle is inserted into the mass, suction is applied while the needle is moved back and forth within the mass with an average of four to six passes. Once cellular material is seen at the hub of the needle, the suction is released and the needle is withdrawn, and the cellular material is then expressed on microscope slides. The tru-cut biopsy was performed by using

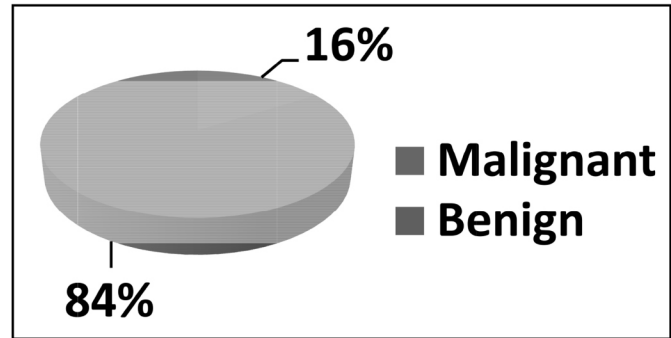
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a disposable tru-cut gun with an 18 gauge needle. After manual localization and immobilization of the lesion, under complete aseptic technique a 2% lignocaine infiltration anesthetic was administered subcutaneously, and a 3-5mm long skin incision done. A biopsy specimen was obtained by means of two to four successive insertions with different angulations of the needle into the core of the lesion. The quantity and quality of the material obtained was judged after immediate immersion of the specimen in fixative, and then specimen was sent to the histopathology department.

The tru-cut biopsy gun can be used effectively for up to 15 cases with changing the biopsy needle only which cost about 10 dollars each, so that we can consider it very cost effective compared with the excisional biopsy which requires general anaesthesia, operation room and surgical staff occupancy apart from the perioperative complications.

Results:

120 females with palpable breast masses were included in this study. Their ages ranged between 16 to 65 years (mean 38.8 years). of the 120 women, 100(84%) had benign lesions and 20(16%) had carcinoma as shown in figure (1). The pathological diagnosis of the 100 benign lesions was as follows: fibroadenosis in 57 cases, duct ectasia in 24 cases, fibroadenoma in 14 cases, benign breast cysts in 3 and duct papilloma in 2 cases as shown in table (1). 20 females (16%) out of 120, presented with palpable breast mass, were found to have breast carcinoma. The age of females diagnosed to have cancer ranged between 33-65 years (mean 51.9 years) .From the 20 malignant cases, 11 females(55%) were suspected of having malignancy by clinical examination only and 18 females(90%)were suspected of having malignancy by both clinical examination and imaging. FNAC diagnosed malignancy in 16 females out of 20 with 80% sensitivity. The specificity of FNAC for detection of malignancy was 100%. By tru-cut needle biopsy 19 females were found to have malignancy out of 20 females affected with 95% sensitivity and 100% specificity as shown in the table (2). P value = 0.289, which is statistically significant. All patients who underwent tru cut needle biopsy had some degree of mild pain and discomfort at the biopsy site which continued for few days and was treated with simple analgesia. 11 patients(9%) had local bruising which subsided shortly thereafter. Two patients(1.6%) had cellulitis and were treated conservatively with the appropriate antibiotics. Excisional biopsy was the most accurate, with a false negative result of zero, approaching a sensitivity of 100% as shown in table(2).



Figure(1): The incidence of malignancy in the breast lumps.

Table (1): The distribution of benign breast lumps.

Diagnosis	No.
Fibroadenosis	57
Duct ectasia	24
Fibroadenoma	14
Benign cyst	3
Duct papilloma	2
Total	100

Table2: Detection of Carcinoma by Tru-cut needle biopsy, FNAC and Excisional biopsy

Carcinoma	FNAC	Tru-cut needle biopsy	Excisional biopsy
Positive	16	19	20
Negative	4	1	0
Total	20	20	20
Specificity	100%	100%	100%
Sensitivity	80%	95%	Almost100%

Discussion:

The gold standard for a definitive diagnosis of a breast lump is the excisional biopsy and histopathology (14). 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 the different forms of available treatment. (15, 16). This study shows that the sensitivity of FNAC was 80% in diagnosis of breast cancer with false negative rate of 20%. The specificity was 100%. This result was similar to other studies done by Mohammed Bdour in Jordon(17) and Tiwari M. in Nepal(18) which show that the sensitivity and specificity of FNAC was (90% and 100%) and (83.3% and 100%) respectively in the diagnosis of breast cancer. This high false negative rate in our study was mainly due to sample error, inadequate material sampled or underestimation

of the cellular atypia which is dependent on the experience of the cytologist. In our study, Tru-cut needle biopsy has a sensitivity of 95% and a specificity of 100% in the diagnosis of breast cancer leaving inadequate results of 5%. These results are comparable to other studies done by Mohammed Bdour in Jordan(17), karimian F. in Iran(19), A.D. Baildam in UK(21), Stanley Minkowitz in USA(20), Syeda Rifaat in Pakistan(22) and Ammar Al-Rikabi in Saudi Arabia(23). Which show the sensitivity was 90%, 98.7%, 95%, 89%, 100% and 95.1 respectively. In these studies the use of Tru-cut needle biopsy is superior to the use of FNAC in the confirmation of breast cancer in a suspicious breast lump which is consistent with the results of our study. Our results regarding Tru-cut needle biopsy did not coincide with another study done by WS Yong in Singapore (6) which revealed that the use of FNAC has a higher chance or rate than the Tru-cut needle biopsy in detecting breast cancer so their results were in favor of the use of FNAC compared to a Tru-cut needle biopsy due to a higher rate of detection (6). There were no false positive results of breast cancer with Tru-cut needle biopsy in our study and this agrees with other studies done by Mohammed Bdour in Jordan(17), Karimian F. in Iran(19), A.D. Baildam in UK(21), Stanley Minkowitz in USA(20) and Syeda Rifaat in Pakistan(22). In our study the sensitivity and specificity of the excisional biopsy were both 100%. This is similar to the results achieved by other studies done by Karimian F. in Iran (19) and by Tiwari M. in Nepal (18). Tru-cut needle biopsy is considered a highly accurate method in the diagnosis of breast cancer with a sensitivity about 95%. Similar to FNAC this procedure is of low cost, safe, easy to perform and less invasive than the surgical biopsy(19). False negative rate are significantly lower than that for FNAC. A study done by Ivan et al showed that there was a good correlation between the Tru-cut needle biopsy and the excisional biopsy in the diagnosis of benign and malignant breast lesions (24). In this study Tru-cut needle biopsy was found to be more accurate than FNAC in the diagnosis of carcinoma in breast lumps and this agrees with the study of C.B. Chou (25).

Conclusion :

FNAC can miss up to 20% of malignant lumps. Tru-cut needle biopsy can have false negative results of up to 5%. With high sensitivity and zero false positive results of the Tru-cut needle biopsy we can consider it as the diagnostic investigation of choice for palpable breast lumps.

Author contributions

Safa M. Al-Obaidi: study conception, design and critical revision.

Ahmed R. Hizam: Interpretation of data, drafting of manuscript and critical revision.

Mahmood Harfash Hassan: Acquisition of data analysis and

drafting of manuscript.

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