ORIGINAL ARTICLE

Diagnostic Accuracy of Trucut Biopsy in the Detection of Breast Lumps

[1]KARIM SHAH FAIZI, [2]TANVEER HAMEED, [3]KHALID AZIM, [4]*SAJID MUKHTAR*, [5]HAMID AHMAD

ABSTRACT

Objective: To determine the diagnostic accuracy of Trucut biopsy in the detection of breast lump, taking post-surgical histopathology as gold standard.

Study design: Cross-sectional survey

Subjects & methodology: The study was conducted at the Department of Surgery, Sahiwal Medical College/DHQ Teaching Hospital, Sahiwal, from 07-02-2011 to 6-02-2012. A total of 40 married and unmarried females > 15 years of age with clinically palpable lump in the breast were recruited in this study. All female patients having acute breast abscess, previously operated and non-motivated patients were excluded from study. Informed consent was taken from all patients for performing Trucut biopsy before surgery. It was a cross-sectional descriptive study. Demographic data was recorded. Previous history was taken and physical examination was done. The core biopsy was performed by using a Trucut gun with an 18-gauge needle. The samples were sent for histology.

Results: Diagnostic accuracy of Trucut biopsy in diagnosis of breast lumps was 90% while sensitivity 96.7%, specificity 70%, positive predictive value 90.6% and negative predictive value was 87.5%.

Conclusion: With the help of Trucut/core needle biopsy many patients can be prevented from unnecessary surgery. It helps in diagnosing breast cancer in younger aged patients having suspicious lumps.

Keywords: Brest lumps, Trucut biopsy, malignancy, benign

INTRODUCTION

Breast is a glandular organ influenced by hormones in females with various structures giving rise to different types of lesion and lumps. Inflammatory lesions, common in lactating group of females, are not as much frequent as non-inflammatory conditions. Benign tumors in young adults have higher incidence. Inflammatory and some benign lesions like fibrocystic change and fibroadenoma are managed adequately with excellent outcome[1].

Breast lump is one of the most common surgical problems in females[2]. It could be benign or malignant Amongst the prevalent causes of breast lumps the most commonly encountered lesion is carcinoma of breast followed by the benign lesions such as fibro adenoma, fibrocystic disease, chronic mastitis and duct ectasia in Pakistani females[3].

Benign breast lumps affect 10% of women in their lifetimes. Despite a favorable natural history enabling surveillance as an option, surgical excision continues to be popular. Avoiding a scar on the breast is an inherent feminine desire[4].

[1]*Assistant Prof,* [4]*Medical Officer, Department of Surgery, Sahiwal Medical College/ DHQ Teaching Hospital, Sahiwal*
[2,3]*Assistant Prof. Department of Surgery, Islam Medical College, Sialkot*
[5]*Consultant Surgeon, DHQ Hospital, Chiniot*
Correspondence to Dr. Karim Shah Faizi, Assistant Prof. Department of Surgery, Sahiwal Medical College/ DHQ Teaching Hospital, Sahiwal. faizishah @hotmail.com

Breast carcinoma is the leading cause of cancer death in women. Most of the time breast carcinoma presents as breast lump.[5] Malignant neoplasm is more frequent in old females like other conditions of cancer.[1] Various types of lesion from inflammation to carcinoma can affect breast. Some lesions are common in young females while others in elderly age group. Early presentation and prompt diagnosis is essential to relieve anxiety of non-neoplastic conditions, and in case of carcinoma, it can save the patient from metastases[1].

Fine-needle aspiration cytology (FNAC) is a simple, accurate, and safe procedure for the diagnosis of palpable breast lumps[6]. 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[7].

Sampling errors are also less common with Trucut biopsy. In a study carried out by Naqvi et al (2010).[8] 10% of trucut biopsies were inadequate as when comparison was made 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. In another study by Grace, found the rate of samples reported as unsatisfactory by core biopsy to be less than that for FNA cytology (12.5% versus 34.2%)[9].

Various studies have been done to determine the efficacy and usefulness of both FNAC and trucut biopsy; and the results vary. FNAC has been found to have a sensitivity ranging from 84% to 97.5% and a specificity of more than 99% to 100%. Trucut biopsy was reported to have a sensitivity of around 90% and a specificity 100%.[10] Naqvi et al demonstrated the overall sensitivity of Trucut biopsy 100 % and specificity was also 100%.[8]

Considering the various options for finding the pathology of a breast lump, and large number of cases which could erroneously be subjected to mastectomy, The aim of study is to find if Trucut biopsy is reliable to evaluate the breast lump and prevent the unnecessary invasive procedure of mastectomy for our cases in Pakistan.

OBJECTIVE

To determine the diagnostic accuracy of Trucut biopsy in the detection of breast lump, taking post-surgical histopathology as gold standard.

MATERIAL AND METHODS

The study was conducted at the Department of Surgery, Sahiwal Medical College/DHQ Teaching Hospital, Sahiwal, from 07-02-2011 to 6-02-2012. A total of 40 married and unmarried females > 15 years of age with clinically palpable lump in the breast were recruited in this study. All female patients having acute breast abscess, previously operated and non-motivated patients were excluded from study. Informed consent was taken from all patients for performing Trucut biopsy before surgery. It was a cross-sectional descriptive study.

Demographic data was recorded. Previous history was taken and physical examination was done. The core biopsy was performed by using a Trucut gun with an 18-gauge needle. After manual localization and immobilization of the lesion, under complete aseptic technique a 2% lignocaine infiltrating anesthetic was administered, and the skin incision performed. A biopsy specimen was obtained by means of four successive insertions with different angulations of the needle into the core of the lesion.

The samples were sent for histology. Patients were subjected to surgical procedures as decided after the complete assessment. The specimens after surgical procedures were sent for histopathological examination. The results of Trucut biopsy and surgical specimen were compared. Data sheet was developed and analyzed in computer software SPSS version 17. Age of the patient was presented as mean±standard deviation. The examination of lump in terms of shape and location was presented as frequencies and percentages. The sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy of Trucut biopsy in the prediction of malignancy in ovarian masses was calculated by generating 2x2 contingency table taking histopathological findings as gold standard.

RESULTS

Majority of the patients were between 51-60 years of age and minimum patients were between 61-70 years old with mean age of 57.7±6.7 years (Table 1). Regarding shape of breast lumps, 15 patients (37.5%) had globular shaped lumps, 4 patients (10%) had spherical shaped lumps and 21 patients (52.5%) had irregular lumps (Table 2). Twenty four women (60%) had lump located in upper outer quadrant, 5 patients (12.5%) had lump occupying outer lower quadrant, 4 patients (10%) had lump in upper inner quadrant, 2 patients (5.0%) had in lower inner quadrant and 5 patient (12.5%) had sub areolar lump Table 3). Out of 40 patients, 30 patients were positive on histopathology and 32 patients were positive on trucut biopsy for breast lumps. Diagnostic accuracy of Trucut biopsy in diagnosis of breast lumps was 90% while sensitivity 96.7%, specificity 70.0%, positive predictive value 90.6% and negative predictive value was 87.5%.

Table 1: Distribution of age (Mean±SD=57.7±6.7)

Age	Number	Percentage
40-50	12	30.0
51-60	23	57.5
61-70	05	12.5

Table 2: Distribution of patients by shape

Shape	Number	Percentage
Globular	15	37.5
Spherical	04	10.0
Irregular	21	52.5

Table 3: Distribution of patients by location (n=40)

Location	Number	Percentage
Upper outer quadrant	24	60.0
Outer lower quadrant	5	12.5
Upper inner quadrant	4	10.0
Lower inner quadrant	2	05.0
Sub areolar	5	12.5

Table-4: Comparison of trucut biopsy and histopathology

Trucut biopsy	Histopathology (Gold Standard)		Total
	Positive	Negative	
Positive	29 (TP)	3 (FP)	32
Negative	1(FN)	7 (TN)	08

Sensitivity= TP / TP+FNx100 = 96.7%
Specificity= TN / TN+FPx100 = 70.0%
Accuracy = TP +TN / TP+TN+FP+FN = 90.0%
PPV = TP +TP / FP = 90.6%
NPV = TN + TN / FN = 87.5

DISCUSSION

Breast cancer is the most frequent site of cancer in females and patients usually present with a palpable breast lump. However, it is sometimes difficult to determine whether a suspicious lump is benign or malignant by a simple clinical assessment[.11]. Fine-needle aspiration (FNA) biopsy, trucut biopsy, or open surgical biopsy may be used for tissue diagnosis of a palpable breast mass. Trucut biopsy is considered reliable and accurate preoperative finding of breast lesions pathology and hormone receptor status as well[.12]. Fine needle aspiration cytology (FNAC) is an easy and inexpensive method of determining histology of breast lumps. Its positive results may be considered reliable but negative results are inconclusive[13]. Breast cancer tumour sampling by core needle biopsy is widely used in many centers and has pointed to be upto 97% accurate at confirming the presence of malignant tissue within a suspicious lesion[14,15].

In our study, majority of the lumps were found to be located in upper outer quadrant (72%) close to study conducted by Clegg-Lamptey and Hodasi at in the department of surgery, university of Ghana Medical School where upper outer quadrant was effected in 65%[16]. In present study, diagnostic accuracy of Trucut biopsy in diagnosis of breast lumps was 90% while sensitivity 96.7%, specificity 70%, positive predictive value 90.6% and negative predictive value was 87.5%. These results showed that core needle biopsy is very accurate in diagnosis of palpable breast lumps and replaces FNAC in most circumstances. Our findings are comparable with the results of the following studies.

Cusick et al[17] conducted a study in the Department of Surgery, San Bernardino County Medical Center, California, reported the sensitivity rate 89%, the specificity rate, 100% and the over-all accuracy rate, 88%[17]. Scopa et al demonstrated the same trend as in our study, they observed accuracy of Trucut needle biopsy was 90% while the sensitivity and specificity were 89 and 100%, respectively[18].

Another study by Homesh et al reported sensitivity (92.3%), specificity (94.8%), diagnostic accuracy (93.4%), positive predictive value (PPV) (100%) and negative predictive value (NPV) (100%) of trucut biopsy. These figures are also comparable with our study[2]. The trucut biopsy of palpable breast lesions based on histological study of tissue specimens can provide all the reliable information. Core biopsy permits a preoperative knowledge of the histological type and prognostic parameters (receptor status, proliferative activity, ploidy, and expression of oncogenes and antioncogenes such as c-erbB-2 and p53), so trucut biopsy will guide the surgeon and the oncologist for ideal modern therapeutic strategy in surgical decision making[19].

CONCLUSION

With the help of Trucut/core needle biopsy many patients can be prevented from unnecessary surgery. Helps in diagnosing breast cancer in younger aged patients having suspicious lumps.

REFERENCES

1. Kumar R. A Clinicopathologic Study of Breast Lumps in Bhairahwa, Nepal. Asian Pac J Cancer Prev 2010;11:855-8.
2. Homesh NA, Issa MA, El-Sofiani HA. The diagnostic accuracy of fine needle aspiration cytology versus core needle biopsy for palpable breast lump(s) Saudi Med J 2005;26:42-6.
3. Siddiqui MS, Kayani N, Gill MS, Pervez S, Muzaffar S, Aziz SA, et al .Breast diseases: a histopathological analysis of 3279 cases at a tertiary care center in Pakistan. J Pak Med Assoc 2003; 53: 94-7
4. Agarwal BB, Agarwal S, Gupta M, Mahajan K. Transaxillary endoscopic excision of benign breast lumps: a new technique. Surg Endosc 2008;22:407-10.
5. Pudasaini S, Talwar OP. Study of fine needle aspiration cytology of breast lumps and its histopathological correlation in Pokhara Valley. Nepal Med Coll J 2011;13:208-12.
6. Ahmed HG, Ali AS, Almobarak AO. Utility of fine-needle aspiration as a diagnostic technique in breast lumps. Diagn Cytopathol 2009;37:881-4.
7. Hussain MT. Comparison of fine needle aspiration cytology with excision biopsy of breast lump. J Coll Physicians Surg Pak 2005; 15:4:211-4
8. Naqvi SRQ, Ahmed TM, Naqvi SSQ. Comparison of diagnostic accuracy of core biopsy for breast lesions with fine needle aspiration cytology. Pak Armed Forces J 2010;1.
9. Grace J. Introduction. In: National Breast Cancer Centre. Breast fine needle aspiration cytology and core biopsy: a guide for practice. Australia: National Breast Cancer Centre ,2004:1.
10. Bdour M, Hourani S, Mefleh W, Shabatat A, Karadsheh S, Nawaiseh O, et al. Comparison between fine needle aspiration cytology and tru-cut biopsy in the diagnosis of breast cancer. J Surg Pak 2008;13:19-21.
11. Giuliano AE. Breast. In: Way LW, Doherty GM, editors. Current surgical diagnosis and treatment. 11th ed. Middle East edition. Beirut (Lebanon): Mc Graw-Hill; 2003. p. 319-43.
12. Al Sarakbi W, Salhab M, Thomas V, Mokbel K. Is preoperative core biopsy accurate in determining the hormone receptor status in women with invasive breast cancer? Int Semin Surg Oncol 2005;2:15.
13. Klein S. Evaluation of palpable breast masses. Am Fam Physician 2005;71:1731-8.
14. Khan S, Kapoor AK, Khan IU, Strestha GB, Sing P. Prospective study fo pattern fo breast diseases at Nepalgunj Medical College (NGMC) Nepal. Khatmandu Uni Med (KUMJ) 2003;1:95-100.
15. Pinder SE, Elston CW, Ellis IO. The role of pre-operative diagnosis in breast cancer. Histopathology 1996;28:53-60.
16. Clegg-Lamptey JNA, Hodasi WM. A study of breast cancer in Korle BU teaching hospital: assessing the impact of health education. Ghana Med J 2007;41:72.
17. Cusick JD, Dotan J, Jaecks RD, Boyle WT Jr. The role of Tru-Cut needle biopsy in the diagnosis of carcinoma of the breast. Surg Gynecol Obstet 1990;170:407-10.
18. Scopa CD, Koukouras D, Spiliotis J, Harkoftakis J, Koureleas S, Kyriakopoulou D, et al. Comparison of fine needle aspiration and Tru-Cut biopsy of palpable mammary lesions. Cancer Detect Prev 1996;20:620-4.
19. Pinder SE, Elston CW, Ellis IO. The role of preoperative diagnosis in breast cancer. Histopathology 1996; 28:563-6.

ORIGINAL ARTICLE