

Evaluation of a Modified Triple Test for diagnosis of breast lumps

Bhavinder Arora¹, Anubhav Bansal², Anand Yadav³, Sanjeev Parshad⁴,
Prof. R. K. Karwasra⁵

¹MS FIAMS FAIS, Associate Professor, Department of Surgery, Pt B D Sharma PGIMS, Rohtak

^{2,3}Junior Resident, Department of Surgery, Pt B D Sharma PGIMS, Rohtak

⁴Professor, Department of Surgery, Pt B D Sharma PGIMS, Rohtak

⁵Sr. Prof & Head, Department of Surgery, Pt B D Sharma PGIMS, Rohtak

ABSTRACT

Background: Breast lumps may not be diagnosed on clinical examination alone and a battery of investigative procedures is required for definitive diagnosis. Triple test (Clinical examination, Mammography and FNAC) is well accepted but mammography is not routinely available. Ultrasonographic examination of breast which is readily available and has been found to be sensitive was used in place of mammography and this modified triple test was evaluated in the present study. Patients and Methods: A prospective study to evaluate the diagnostic efficacy of clinical examination, ultrasonography and FNAC individually and in combination for the diagnosis of palpable breast lump was conducted in the department of surgery and surgical oncology, Pt. B. D. Sharma PGIMS, during the time period of 2007-2009. Sonographic investigation was performed using a linear probe 5-12 MHz. In all cases FNAC was done using fine 22 to 23 gauge needle of 2.5-4 cm for aspiration. All cases were operated and correlated histopathologically

Results: Accuracy of Clinical examination, FNAC, and ultrasound in the diagnosis of Benign breast lump were 88.0%, 93.7%, and 94% respect. Sensitivity and specificity of modified triple test (C.E., USG, and FNAC) in comparison to histopathology in the diagnosis of breast carcinoma was 100% and 96.15% respectively.

Conclusion: Modified triple test is cost-effective, widely applicable and a reliable diagnostic approach in palpable breast lump.

INTRODUCTION

The development of a lump in breast is of concern to a woman. The self palpation of breast and growing awareness by women can bring them to a physician. Once a female with breast lump approaches a clinician, the diagnostic dilemma is to authenticate a cancerous or a benign lump. The acumen is tested in the form of clinical examination aided by mammography and authentication by fine needle aspiration. The triad of clinical examination, mammography and fine needle aspiration, thereby known as triple test is best in the diagnosis of breast lump. Mammography being a screening modality with limited availability and indication has been replaced by ultrasonography in this Modified Triple Test (MTT).

Initial investigation of breast symptoms should be by clinical assessment. Most of the breast conditions under ANDI and other conditions such as accessory breasts and nipple, Mondor's disease, and gynaecomastia are diagnosed by clinical examination only.^{1,2} To determine whether a mass is present or not is crucial. Normal structures which can be mistaken for a mass include a prominent rib or a costochondral junction or a firm margin at the edge of a defect or a lobulated circular terminus of firm breast tissue at the border of areola. The accuracy of palpation in evaluating a mass is limited because signs of cancer are not distinctive. Those breast lumps which have indistinct border or have attachment to skin or deep tissue, non-tender, which produces dimpling of skin, retraction of nipple and bloody discharge from nipple are suggestive of malignancy.³

USG is a well accepted breast screening to assess palpable and non-palpable lumps. In x-ray mammography, the fat gives excellent contrast for delineation of lumps but USG can detect cancers that are both mammographically occult

and too small to palpate.⁴ Benign USG characteristics include markedly hypoechoic tissue, ellipsoid shape, well circumscribed lobulations and a thin echogenic pseudocapsule. Malignant characteristics include sonographic speculations, taller than wide lesion, angular margins, markedly hyperechoic nodule shadowing, punctuate calcification, duct extension, branching pattern and microlobulations. Stavor's et al conducted a study to determine whether sonography would help accurately to distinguish benign solid breast nodule from indeterminate or malignant nodules and whether this distinction could be definitive enough to obviate biopsy.⁵

FNAC of the breast has been a safe, simple and cost-effective procedure. It helps in immediately distinguishing cyst from solid masses. It has a potential for an important role in managing benign breast disease and helps to reduce the open biopsies for benign disease without risk of missing cancers.⁶ The drawback of aspiration biopsy sighted are spread of the tumour along needle tract and embolization via the efferent lymphatics and vascular channels. Among the false negative diagnosis of FNAC are tumour size less than 1cm or a highly cellular scirrhous carcinoma where dense collagen stroma and cancer cells are firmly adherent.⁷ The false positive diagnosis can be because of inexperienced pathologist, difficulty to distinguish invasive from non-invasive carcinoma and lymphoma from ductal carcinoma. Epithelial proliferation, duct papillomas, fibroadenomas, fat necrosis, mastitis, gynaecomastia, post-radiation mastitis have led to false positive diagnosis.⁸

The prospective study was conducted with an aim to determine reliability of modified triple test (MTT) consisting of clinical examination, USG, FNAC and comparing them with histopathological finding as a final tool in the diagnosis of breast lumps. The sensitivity and specificity of clinical examination, ultrasonography, FNAC was assessed individually comparing it with histopathological diagnosis and in combination as MTT.

MATERIAL / METHODS

In all cases a thorough history was taken followed by a detailed clinical examination. Sonographic investigation was performed using a linear probe 5-12 MHz. In all cases FNAC was done using fine 22 to 23 gauge needle of 2.5-4 cm for aspiration. All cases were operated and correlated histopathologically. The study group consisted of 50 patients attending OPD for a palpable breast lump. The study excluded patients with locally advanced breast cancer and metastatic disease.

OBSERVATION AND RESULTS

AGE DISTRIBUTION

The age of the patients suffering from malignancy ranged from 29 to 75 years, with a mean age of 42.1 years.

SIDE DISTRIBUTION

Out of 30 cases of breast malignancy 19(63.33%) patients were found to have lump in left side of breast while 11(36.67%) patients had lump in right side of the breast.

SITE DISTRIBUTION

In 30 cases of malignancy of the total 50 patients, lump was present in the upper and outer quadrant of the breast in 18(60%) patients, followed by lower and outer quadrant in 4(13.33%) patients. Lower inner quadrant and central location of lump was seen in 3 (10%) patients each. Upper inner quadrant lump was found in only 2(6.66%) patients.

Table 1: Comparison of number of cases as per C.E., FNAC and ultrasound with histopathology

	Benign	Malignant
Clinical examination	21	29
Ultrasonography	16	29
FNAC	16	30
Histopathological diagnosis	20	30

Table 2: Comparison of accuracy of C.E., FNAC and ultrasound in the diagnosis of breast lump

Test	Malignant			Benign		
	Sensitivity	Specificity	Accuracy	Sensitivity	Specificity	Accuracy
C.E.	87.0%	89.4	88.0	93.7%	86.0%	89.4%
FNAC	93.5%	94.7%	94.0%	86.6.0%	100%	94.7%
Ultrasund	88.2%	96.9%	94.0%	85.7%	91.6%	89.4%

Table 3: Validity of modified triple test vs Histopathology

Modified Triple Test	Histopathology		
		Positive	Negative
	Positive	A 14 True Positive	B 1 False Positive
Negative	C 0 False Negative	D 23 True Negative	

Table 4: Validity of modified triple test vs HPR in 50 patients

Sensitivity	100.0%
Specificity	95.8%
Accuracy	97.0%
Predictive value of positive test	93.3%
Predictive value of negative test	100.0%

RESULTS

A total no of 50 patients were subjected to clinical examination, ultrasound, FNAC and histopathological examination. Sensitivity, specificity and accuracy of clinical examination for the diagnosis of breast carcinoma were 87.0%, 89.4%, and 88.0% respectively. Sensitivity, specificity and accuracy of ultrasound for the diagnosis of breast carcinoma were 90.3%, 94.7% and 92.0% respectively. Sensitivity, specificity and accuracy of FNAC for the diagnosis of breast carcinoma were 93.5%, 94.7%, and 94.0% respectively. Accuracy of Clinical examination, FNAC, and ultrasound in the diagnosis of Benign breast lump were 88.0%, 93.7%, and 94% respect. Sensitivity and specificity of modified triple test (C.E., USG, and FNAC) in comparison to histopathology in the diagnosis of breast carcinoma was 100% and 96.15% respectively. Accuracy of modified triple test (C.E.,USG and FNAC) in comparison to histopathology in the diagnosis of breast carcinoma was 98.0%.

DISCUSSION

In India breast carcinoma is the second commonest cancer in females after carcinoma cervix. Because of high mortality and morbidity, every case of breast mass should be thoroughly investigated for detection of carcinoma. Early detection and treatment of breast carcinoma definitely decreases the mortality and morbidity.⁹ Present study was undertaken in an effort to assess the diagnostic accuracy of clinical examination, fine needle aspiration cytology and ultrasonography individually and in various combinations in diagnosis of breast lump.

In our study the median age of presentation was 42.1 years (29-75 age range). The sixty percent patient with breast lump in our study were of carcinoma (n=30). Most common site of malignant breast lump in our study was upper and outer quadrant of breast (60%), as had been also reported by other western and Indian authors.¹⁰ Ninety percent patient of benign breast lump in our study had fibroadenoma suggesting an important aspect of our study that fibroadenoma is most common mass in young females.

Sensitivity and specificity of clinical examination in diagnosis of breast cancer in our study was 87.0% and 89.4% respectively, whereas sensitivity and specificity of clinical examination in diagnosis of benign breast lump was 100% and 90.9% respectively. These findings are comparable to other studies as done by Ashley et al¹¹ and Leis et al¹² where sensitivity was found to be 85 and 80% respectively. Overall the results of clinical examination are correct in 60% to 85% of cases.¹³ In our study false positive rate of clinical examination was 10.5% which is comparable to study done by Mande et al¹⁴ with false positive rate of 11%. Sensitivity and specificity of ultrasonography in diagnosis of breast cancer in our study was 90.3% and 94.7% respectively. These findings are similar to sensitivity reported by Stavros et al⁵ and Mansoor et al¹⁵ with sensitivity of 98.4% and 86% respectively. Sensitivity and specificity of ultrasonography in diagnosis of benign breast lump was 88.2% and 96.9% respectively. Thus, clinical examination is more sensitive but less specific in the diagnosis of benign lump whereas in the diagnosis of breast cancer USG is more sensitive and also more specific than clinical examination

Sensitivity and specificity of FNAC in diagnosis of breast cancer in was 93.5% and 94.7% respectively, exceeding both the other two modalities in diagnosing a breast cancer. Sensitivity of FNAC in the diagnosis of benign breast lump was 83.3%, suggesting that clinical examination is superior of the three modalities in diagnosing a benign breast lump. Sensitivity and specificity of modified triple test (clinical examination, USG and FNAC) in diagnosing a malignant breast lump were 100% and 95.8% respectively. Accuracy of triple assessment was 97.0%. To conclude, use of triple test in diagnosis of breast lump is most accurate instead of using a single modality alone. But in developing countries like India modified triple test is more useful because of its cost effectiveness, wide availability and better diagnostic accuracy.

REFERENCES

- [1]. Steering committee on clinical practices guidelines for the care and treatment of breast cancer. The palpable breast lump: information and recommendations to assist decision-making when a breast lump is detected. *cmaj* 1998; 158: 3-8.
- [2]. Winchester DP. Clinical examination of the breast. *Cancer* 1992; 69: 1947-9.
- [3]. Donegan WL. Evaluation of a palpable breast mass. *N Engl J Med* 1992;327:937-42.
- [4]. Rosenberg Al, Schwartz Gf, Feig Sa, Patchefsky As. Clinically occult breast lesion localization and significance. *Radiology* 1987; 162:167-70.
- [5]. Stavros AT, Thickman D, Rapp CL, Dennis MA, Parker SH, Sisney GA. Solid breast Nodules: Use of sonography to distinguish between benign and malignant lesions. *Radiology* 1995;196:123-4.
- [6]. Langmuir VK, Cramer SF, Hood ME. Fine needle aspiration cytology in the management of palpable benign and malignant breast disease: Correlation with clinical and mammographic findings. *Acta Cytol* 1989;33:93-8.
- [7]. Kreuzer G, Zajicek, J.:Breast. In *Aspiration Biopsy Cytology*. Part 1. Monographs in Clinical cytology, Vol. 4.(Ed.) G.L. Wied.S.Karger,Basel, 1974.
- [8]. Webb AJ. The diagnostic cytology of breast carcinoma. *Br J Surg* 1970;57:259-64.
- [9]. Malik G, Waqar F, Buledi GQ. Sonomammography for evaluation of solid breast masses in Young patients. *J Ayub Med Coll Abbottabad* 2006;18:34-7.
- [10]. Sainsbury R. The breast. In: Williams NS, Bulstrode Christopher JK, O'Connell PR, editors. *Bailey & Love's Short Practice of Surgery*. 25th ed. London; Arnold. 2008. p.827-50.
- [11]. Ashley S, Royle GT, Corder A, Herbert A, Guyer PB, Rubin CM, et al. Clinical, radiological and cytological diagnosis of breast cancer in young women. *Br J Surg* 1989;76:835-7.
- [12]. Leis HP Jr. Gross breast cysts: significance and management. *Contemp Surg* 1991;39:13-20.
- [13]. Breast Surgeons Group of the British Association of Surgical Oncology, Guidelines for surgeons in the management of symptomatic breast disease in the United Kingdom. *Ear J Surg Oncol* 1995; 21:1-13.
- [14]. Mande N, Gakwaya AM, Byanyima RK, Othieno E. The triple assessment in the preoperative evaluation of patients with breast cancer in Mulago Hospital, Kampala – Uganda. *East Central Afr J Surg* 2004;9:111-6.
- [15]. Mansoor T, Ahmad A, Harris SH, Ahmad. Role of ultrasonography in the differential diagnosis of palpable breast lump. *Indian J Surg* 2002;64:499-501.