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A Study of Modified Triple Test Score for Assessment of Palpable Breast Lump

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ABSTRACT

Breast lump is a common complaint of women presenting to surgeons. Although most of them are benign, careful evaluation, exact diagnosis and definite treatment is mandatory to rule out cancer. Young women are conventionally evaluated by triple test score which consists of clinical breast examination, mammography and fine needle aspiration biopsy. The sensitivity of mammography is low in young breast owing to its increased glandular component. Ultrasonography can be used for evaluation and diagnosis these breast lumps with sensitivity and specificity more than 80%. This study evaluated the efficacy of ultrasound instead of mammography in the conventional 'triple test score' for diagnosis of palpable breast lumps in young females and compare the result with open biopsy. 50 females with breast mass, of the age group 15 to 60 years were selected randomly and assessed by clinical breast examination, local ultrasonography of both breasts and fine needle aspiration biopsy to calculate a 'modified triple test score'. The 'modified' score was calculated by assigning score 1 for benign, score 2 for suspicious and score 3 for malignant results in each component and adding them up. All the masses were thereafter evaluated by open biopsy with consent. Score of 4 or less is interpreted as benign, 5 as inconclusive/equivocal, 6 or more as malignant in Modified Triple Test Score. In the study, out of 50 patients 41 scored 3 or 4 points; all of which were benign, 3 scored 5 points; of which 1 was malignant and 6 scored 6 or more points; all of which were malignant. In our study we studied the results of score Points along with the final histopathology of the respective patient. Breast masses with a MTTS of 7 or more points were accurately diagnosed as malignant, thus a score of 7 or more points can proceed to definitive therapy, masses scoring 4 or less points were all benign could be safely observed and masses scoring 5 points need further evaluation with clinical examination and open biopsy. The MTTS is as accurate as conventional TTS in evaluation of breast masses in Young females and can avoid unnecessary evaluation. The score was particularly found to be useful for evaluation and analysis of breast lumps in young females.

Keywords: Modified triple test score (MTTS); Palpable breast masses; Benign; Malignant.

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INTRODUCTION

Patients with breast problems make up a major part of the patient load at a general surgical out-patients clinic. With the increasing public and professional awareness each year large number of young women are being referred to general surgeons with palpable breast masses. Some of breast masses are clinically ambiguous and present as a dilemma to the surgeons. Breasts are the most important feature of female anatomy and an integral part of the reproductive system. They are symbols of womanhood and fertility. Thus, every woman with a breast mass, breast pain or discharge from nipple fears that she has breast cancer. Majority of them prove to be benign, but the probability of the diagnosis of a cancer is never zero. So careful evaluation, exact diagnosis and definite treatment is mandatory in any breast mass. Despite centuries of theoretical meanderings and scientific research, cancer of the breast remains one of the most dreaded of human diseases. The breast being a paired organ further increases its exposure to the disease[1,8]. Open surgical biopsy has been the "gold standard" or "reference standard" method of evaluating a suspicious breast lesion[2]. However surgical excision or biopsy of mass can be painful, expensive and frequently unnecessary in the young age groups, which have very low rates of malignancies. The dilemma still remains that the dogmatic statement: "every palpable mass in the breast must be excised" should be replaced by the recommendation that "every palpable mass in the breast must be assessed and clarified"[9]. Breast mass is a common complaint along with pain. Such symptomatic masses have been traditionally assessed by clinical, cytological and radiologic modalities like mammography[3,4]. While open biopsy provides more data, it results in undesirable cosmetic problems. Thus, up to 95% of such lesions could be diagnosed by the triple assessment. Although the role of FNAC and Clinical examination has been unanimous[5], the role of USG, instead of mammography, has been emphasised recently[11,13,14], especially in the young Female population. Although the sensitivity of Mammography has been proven, additional diagnostic procedures often become necessary in view of its low specificity[6,7]. These values deteriorate further in young women under 40 years of age because of the denser breast tissue. This makes sonography more useful in such patients. In spite of the individual appreciable false negative rates

associated with these modalities, the recent technological advancements in these diagnostic modalities have improved sensitivity approaching invasive methods like open biopsy, thus avoiding a number of unnecessary 'scars', stress, workload and expenditure[15].

MATERIALS AND METHOD

This Prospective study includes 50 females of the age group 15 to 40 years selected randomly, having a breast mass (in one or both the breasts), who attended the OPD or were admitted in our department of surgery during the period of December 2010 to August 2012. Patients having complaint of breast mass were assessed as follows:-

1.Clinical breast examination of the breast mass for size, site, consistency, tenderness, mobility, fixity of lump to breast tissue, skin or deeper structures.

2.Ultrasonography (local) of both the breasts and axillae.

3.Fine needle aspiration cytology (FNAC) of Breast mass.

A Modified triple test score (MTTS) was calculated by summation of the individual scores of all the three components of the modified triple test. Each component was graded by a score of 1, 2 or 3 as per the findings. Each Patient was assessed independently by an expert in the use of respective modality. An individual score was appointed based on the findings in respective test. Accordingly, a completely benign finding was given a score of 1 point, a suspicious finding was given a score of 2 points and a malignant finding was given a score of 3 points.

Thus, on physical examination:

A soft or firm, freely mobile lump was assigned a score of 1.

A lump with doubtful fixity to skin or breast tissue & not freely mobile was assigned a score of 2. A hard, immobile lump with definite fixity to skin or breast tissue was assigned a score of 3.

Photo 1: Clinical Examination

On Ultrasonography:

A round to oval, ellipsoidal, hyper- or hypo-echoic lump with thin echogenic pseudo capsule, width to anteroposterior diameter ratio >/= 1.4 & gentle bi- / trilobulation w/o any malignant finding was assigned a score of 1. An iso-/mildly hypo-echogenic lump with normal/enhanced sound transmission & a homo/hetrogenous texture was assigned a score of 2. A poorly defined, irregular lump with mixed/marked hypoecogenicity, width to AP diameter ratio </=1.4, spiculation, angular margins, calcification, shadowing, duct extension, brand pattern or microlobulation was assigned a score of 3.

Photo 2: Sonography Machine

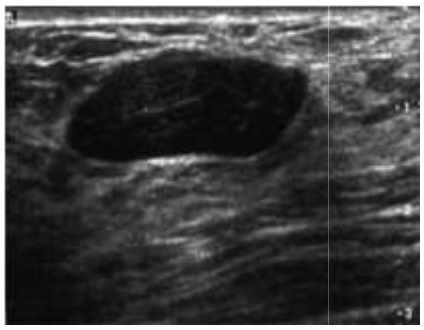

Photo 3: US appearance of fibroadenoma.

On FNAC:

A lump with benign report was assigned a score of 1. An ambiguous or suspicious for malignant cells report was assigned a score of2.

A positive for malignant cells report was assigned a score of 3.

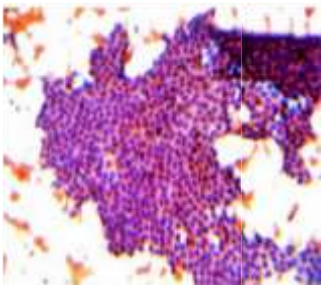

Photo 4: FNAC appearance of Fibrodenoma (Benign)

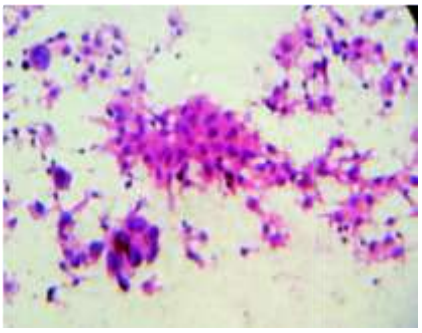

Photo 5: FNAC appearance of malignant breast mass

The respective scores were combined to calculate the MTTS for each patient.

1.A combined score of 6 or above was considered as malignancy.

2.A combined score of 5 was considered as equivocal.

3.A combined score of 4 or less was considered as benign.

All patients were subjected to excisional biopsy with consent for the purpose of this study. Biopsy report was correlated with modified triple test score (MTTS).

All patients having strong family history breast malignancy were treated aggressively irrespective of their Modified Triple Test Score.

Criteria of Exclusion:

Previously diagnosed malignancy of the same breast, Obvious advanced malignancy of breast, Radiation therapy given to the breast, acute inflammatory conditions of the breast and Male patients with breast mass.

Observations and Results

Out of the 50 patients included in the study it was found that incidence of breast mass was more in the age group of 15 to 25 years (42%)(Table 1). The manage of the patients was 29. 66 years with SD±11. 21. The duration of awareness of lump in breast at the time of presentation was found to be 1-3 months (Table 2). 50 % patients were aware about lump for a period between 1 to 3 months. The most common side of breast affected was left (56%) (Table 3).

Table 1 : Age Wise Incidence Of Breast Mass

Age Group (in years)	No. of Cases	Percentage
15-25	21	42
26-35	14	28
36-45	8	16
46-60	7	14
Total	50	100

Table 2: Duration Wise Distribution

Duration of Lump (in months)	No. of Cases	Percentage
1-3	25	50
4-6	13	26
>6	12	24
Total	50	100

Table 3: Most Common Side of Breast Affected

Side	No. of Cases	Percentage
Left	28	56
Right	22	44
Total	50	100

Table 4: Most Common Site of the Tumour In The Breast

Quadrant of the Breast	No. of Cases	Percentage
Upper Outer quadrant	20	40
Upper Inner quadrant	16	32
Lower Outer quadrant	10	20
Lower Inner quadrant	3	6
Central	1	2
Total	50	100

Table 4 shows most common quadrant of the breast involvement in breast mass. Upper half of breast involved in 72% of cases in which Upper outer quadrant was involved in 40% of cases; upper inner quadrant was involved in 32% of cases. Lower outer quadrant was involved in 20% of the cases, lower inner quadrant was involved in 6% of cases and central quadrant was involved in 2% of the cases

Table 5: Consistency of the Mass

Consistency	No. of Cases	Percentage
Hard	13	26
Firm	35	70
Soft	2	4
Total	50	100

The average Consistency of the Mass was firm in most (70%) of the patients (Table 5). There were 26% masses hard on consistency and only 4% masses were soft in consistency.

Table-6: Size of the Mass

Size of Mass (in cms)	No. of Cases	Percentage
<2	3	6
2-5	45	90
>5	2	4
Total	50	100

Mean ±SD: 3.08±1.3

In the present study, The Average size of the mass was less than 5 cm in 96% of patients in which patients having breast mass less than 2 cm were 3 and those having 2-5 cm were 45 (Table 6). Out of 50 patients 48 patients (96%) had a mass of size less than 5 cm while only 2 (4%) patients had mass >5 cm in size.

Table-7: Histo-Pathological Examination of Mass

Type		No. of Cases	Percentage
Benign	Fibroadenoma	28	56
(n=43)	Fibrocystic disease	11	22

	Breast phylloides	2	4
	Breast abscess	2	4
Malignant		7	14
Total		50	100

In the present study, all patients were subjected to histopathological examination. On Histo-Pathological examination, most 43 (86%) of the masses were diagnosed as benign (Table 7). The most common diagnosis was found to be a benign fibro-adenoma (56%). The next most common finding was consistent with fibrocystic disease of the breast (22%). Breast abscess and benign phylloides were 2% each. Out of 50 biopsies, 7 (14%) biopsies were diagnosed as malignant.

Table-8: Modified Triple Test Score

MTTS Score	No. of Cases	Prediction (diagnosis)
≤4	41	Benign
5	3	Suspicious
≥6	6	Malignant

The Modified triple test scores of the cases in our study were as follows; 41 patients (82%) had a MTTS of 3 or 4 points considered benign. 3patients had score of 5 considered suspicious. 6 patient had a score of 6 or more considered malignant.

Table-9: Description of Patients with MTTS Of 5

Clinical breast examination	Ultrasonography	Fine needle aspiration cytology	Modified triple test score	Histopathological report
2	1	2	5	Benign
1	1	3	5	Malignant
2	2	1	5	Benign

3 masses out of 50 had a score of 5 points. These masses were identified as suspicious by at least two modalities of the Modified triple test. Out of these, two masses that were found suspicious on Clinical breast examination were confirmed as benign on Histopathological report HPR. While 1 mass that was found suspicious on Ultrasonography, was confirmed as benign on histopathological report. Only one mass was identified as malignant on Fine needle aspiration cytology and identified benign on both clinical breast examination and ultrasonography which was confirmed as malignant on Histopathological report.

Table-10: Heading

Test	Rightly Diagnosed	Not rightly diagnosed	Total no. of cases
Modified triple test	47	3	50
Open biopsy	50	0	50

Statistically analysis of two values in modified triple test and open biopsy in all 50 patient was done. The result of the modified triple test and open biopsy were compared in a same set of patient in a2×2 table and chi square test was applied with degree of freedom as 1, the p value was 0. 079 making it non-significant, so there is strong recommendation that null hypothesis is accepted. This means that statistically MTT is as good as open biopsy/core biopsy. We recommend that biopsy should be advised to only those patients having MTTS of 5.

RESULTS AND DISCUSSION

Breast Cancer deprives us all too frequently and prematurely of our mothers, sisters, wives and daughters. It remains the leading organ site of cancer incidence in female after cervical cancer. Also it could be fatal if it is not cured by our initial efforts. The tumours in women under 40 years of age tend to behave more aggressively as compared to older patients.[43] The detection of cancerous lesions becomes difficult in younger women owing to the more firm and more glandular consistency of these breasts.[44] With increasing public awareness, patient expectations for a successful and efficient management of carcinoma breast have risen. There is also an increasing professional obligation on the part of clinicians for improved delivery of healthcare for patients of breast diseases. The rise of public awareness and concern has brought up new changes in referral patterns of patients with breast symptoms. Thus more and more patients are being referred to specialists. With these referrals the ratio of benign to malignant ratio has risen consistently. Every woman with a breast mass, breast pain or discharge from nipple fears that she has breast cancer. Majority of them prove to be benign but the probability of the diagnosis of a cancer is never zero. So careful evaluation, exact diagnosis and definite treatment is mandatory in any breast mass. During the past 2 decades a number of additional methods for assessing breast lesions have been investigated. These include Thermography, Radioisotope scanning, Ultrasound, Computed Tomography and Magnetic Resonance Imaging.

Earlier used Triple test score is not reliable for young women which have more dense glandular tissue. Ultrasound is more reliable than mammography for diagnosing dense glandular tissue and differentiate cystic from solid masses. The ability to recognize cystic mass is an important specialty of ultrasound in younger patient.

So The MTTS scoring system substitutes ultrasonography for mammography in women younger than age 40 years. Every component of MTTS having 1, 2, 3 for benign, suspicious and malignant respectively. Thus the minimum score is 3 and maximum is 9. Masses with a MTTS of 3 and 4 points are benign and may be safely followed up. Masses of a MTTS ≥6 points are all

malignant and may proceed to definitive therapy. Only the masses with a MTTS of 5 points cannot be diagnosed and will require an additional open biopsy for confirmation.

The present study was carried out in 50 female patients with breast lump. The parameters were statistically analyzed.

CONCLUSION

Breast lumps may be benign or malignant but the majority of them prove to be benign and the probability of a cancer is never zero. With the use of Mammography, Ultrasound, MRI of breast and Needle Biopsies the diagnosis of benign breast disease can be accomplished without surgery in majority of patients. So careful evaluation, exact diagnosis and definite treatment is mandatory in any breast mass.

From the result of the study we found that:

- Incidence of breast lump is more common in younger age group
- Left side of breast is more commonly effected than right.
- Upper outer quadrant is more commonly involved than the other quadrant of breast.
- Most of the lumps are firm in consistency on palpation.
- Most of patient presented with lumps are less than 5 cm in size.
- Most patient present within 1-3 month after first awareness of breast lumps.
- Benign pathology is most common in all breast lumps.

Importance of MTTS

1. The modified triple test score was found to be highly accurate in our study to diagnose a palpable breast lump as benign or malignant.
2. The Modified Triple Test Score conclusively diagnosed more than 94% of the patients without the need for further investigation. The Modified triple test score had a substantial agreement with histopathological reports of the masses subjected to additional biopsy.
3. The Modified triple test has the advantage of being applicable to majority of young patients presenting to an outpatient department. The modalities involved have the advantages of being widely available, fairly accurate, less time consuming, relatively cheap, and non-invasive with no environmental risks and no side effects.
4. The assessment of breast masses using MTTS does not require admission to hospital and can be done on outpatient basis.

Thus with the use of MTTS for assessment of palpable breast masses in young females, open biopsy could have been avoided in majority of patients. We recommend that biopsy should be advised to only those patients having MTTS of 5.

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