



A Study of Modified Triple Test Score For Assessment of Palpable Breast Masses In Females In Western U.P.

KEYWORDS

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

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ABSTRACT *Background: Breast lump is the most common complaint of women presenting to surgical opd. 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, radiology and cytology/histopathology. The sensitivity of mammography is low in young breast owing to its increased glandular component. Ultrasonography can be used for evaluation and diagnosis of such breast lumps with sensitivity and specificity more than 80%. Methods: This study evaluated the efficacy of ultrasound instead of mammography in the conventional 'triple test score' for diagnosis of palpable breast lumps in young women and compare the result with open biopsy. 100 females with breast masses, of the age group 16 to 78 years were selected randomly and assessed by clinical breast examination, high resolution 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. Results The modified triple test score was calculated for all the cases. 64 out of 100 cases had score less than 4. All the cases with score 4 or less than 4 were found benign on FNAC and final diagnosis. There were 12 cases which had score of 5. Of these 12 cases 7 were found benign and 5 were malignant. There were 26 cases which had score of 7 and more all these cases were found malignant on the final diagnosis.*

Conclusion: Our study 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.

Introduction

Women with breast problems make up a majority 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, mastalgia 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. 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 evaluated"⁹. Breast mass is a common complaint along with pain. Such symptomatic masses have been tradition-

ally 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 unanimous⁵, 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 expenditure¹⁵.

Materials and Methods

The present prospective study was carried out in the Department of Surgery at N.S.C.B. Subharti Medical College Meerut, over a period of 2 years from 2013 to 2015. 100 patients presenting with palpable breast lump in the out patient department or admitted in the wards will be included in the present study.

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-echoic lump with normal/enhanced sound transmission & a homo-/hetero- genous texture was assigned a score of 2.

- A poorly defined, irregular lump with mixed/marked hypoechogenicity, width to AP diameter ratio ≤ 1.4 , spiculation, angular margins, calcification, shadowing, duct extension, band pattern or microlobulation was assigned a score of 3.



Photo 2 : MEDISON ACCUVIX A30 High Resolution Usg Machine used

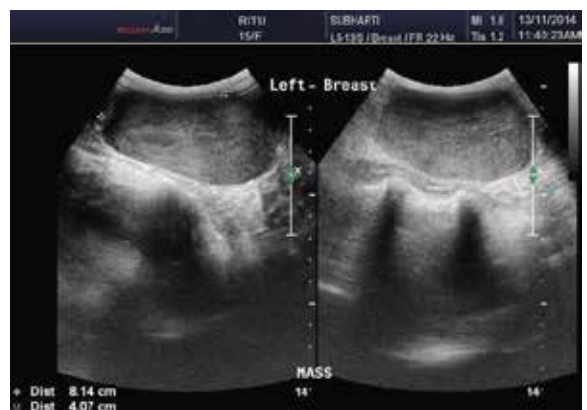


Photo 3 : US appearance of fibroadenoma.

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 of 2.
- A positive for malignant cells report was assigned a score of 3.

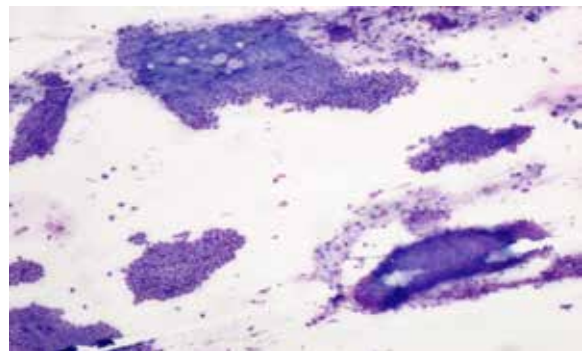


Photo 4: FNAC appearance of Fibroadenoma (Benign)

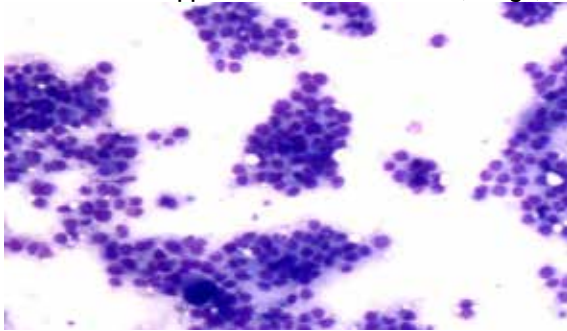
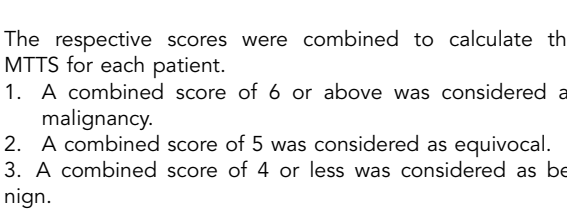


Photo 5: FNAC appearance of malignant breast mass



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.

Exclusion criteria

1. Patients with a past history of surgery for malignant lesion in the same or opposite side and clinically suspected inflammatory lesions like fungating masses/ ulcer will be excluded.
2. Patients having axillary lump/Lymph node mass.

Observations and Results

The Age of the patient in the present study ranged from 16 years to 78 years with the mean age of 38.24 years. (Graph 1).

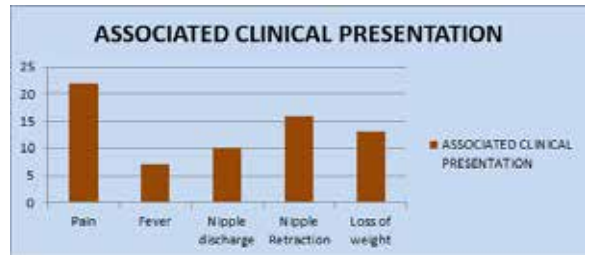


Graph 1: Age wise distribution

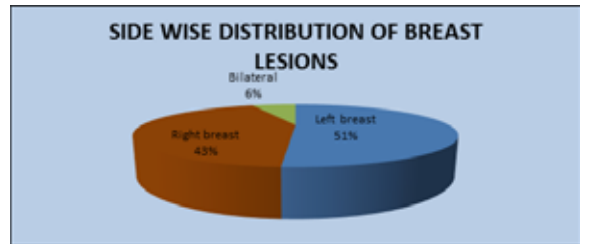
The mean age of benign breast lesions was 29.04 years and of malignant lesions was 56.9 years. The youngest patient was of the age 16 yrs old female. The eldest patient was of 78 years.

Patients presenting with breast lump were included in the study. Other associated presentations along with lump like pain and was noted in 22% (22/100). Other complaints like discharge from nipple was seen 10% (10/100) patients (Graph 2)

Graph 2 : Associated clinical presentation

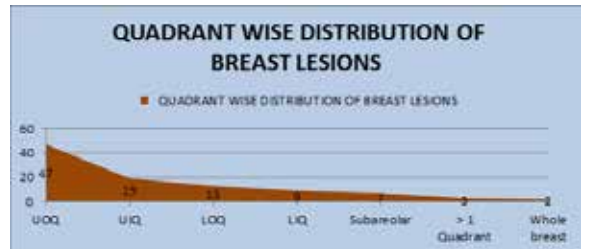


It was observed that left sided (51%) breast lesions were more common than right sided (43%) with the ratio of 1.2: 1. Only 6% (6/100) cases showed bilateral breast lesions. (Graph 3)



Graph 3 : Side Wise Distribution Of Breast Lesions

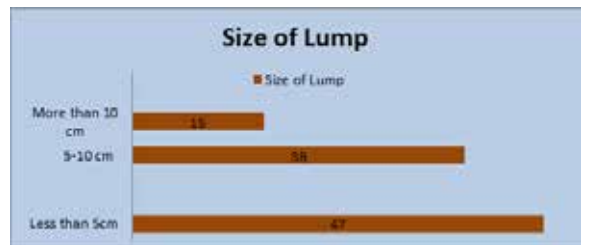
Most common involvement of breast lesions was found to be upper outer quadrant (47%) followed by upper inner quadrant (19%) and lower outer quadrant (14%). Whole breast was involved in 8 (2 %) lesions



Graph 4 : Quadrant Wise Distribution Of Breast Lesions

In the present study, the consistency of mass was assessed by clinical breast examination. The masses were categorised as soft, firm and hard on palpation. The average Consistency of the Mass was firm in most (73%) of the patients.

In the present study, the size of the mass was assessed by palpation. The maximum diameter of the mass was assessed in different planes. Most of the lumps were sized less than 5cm in our study (47%) cases



Graph 5 : Size of Lump

Axillary Lymphadenopathy was seen in 23 cases. All these cases were found to be malignant.



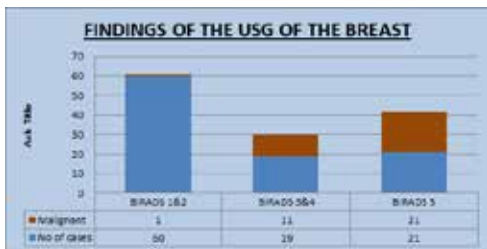
Graph 6 : Axillary Lymphadenopathy

On the basis Of clinical assessment we found that all the patients (27 %) with clinical score of 1 were finally diagnosed with benign breast disease. Out of 34 patients with clinical score of 3, 27 (79 %) had malignant disease.



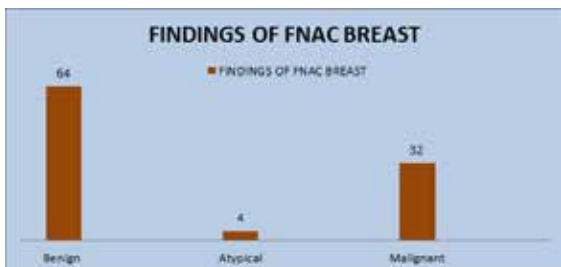
Graph 7: Assessment of clinical examination

On Ultrasonographic assessment we found that all the cases with BIRADS 5 were found malignant in the final diagnosis. Out of 60 cases only one case with BIRADS 2 and USG score of 1 was found Malignant on FNAC. 11 out of 19 cases with USG score of 2 (BIRADS 3 or 4) were found malignant of final diagnosis. It was found out that there is great concordance of USG score 1 with benign lesions and USG score of 3 with malignant lesions. The sensitivity of USG is calculated as 95.45 % for this study and specificity of 92.50%.

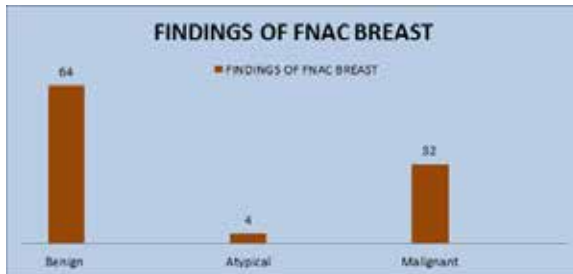


Graph 8 Ultrasonographic assessment

The FNAC was performed in all the cases and Histo-pathological examination was done in all the cases where biopsy was performed. The definitive procedures were performed in all 32 cases where FNAC was found malignant. Among the 4 cases of atypical reporting excision biopsy was performed. 1 out of these 4 cases was found out to be malignant and rest 3 cases were benign.

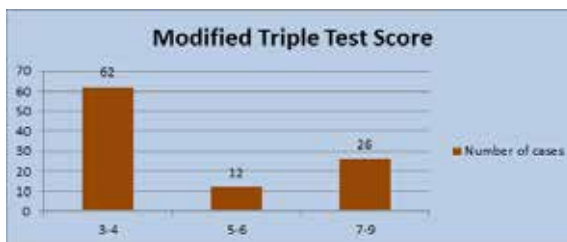


Graph 9: FNAC assessment



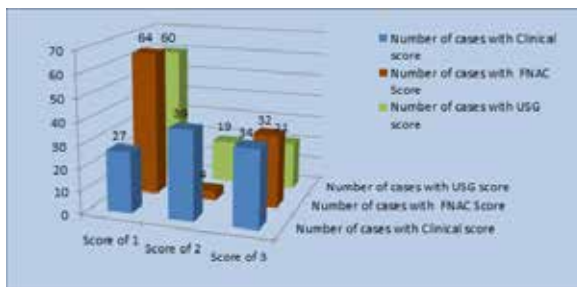
Graph 10 Atypical Cases of FNAC

The modified triple test score was calculated for all the cases. 64 out of 100 cases had score less than 4. All the cases with score 4 or less than 4 were found benign on FNAC and final diagnosis. There were 12 cases which had score of 5. Of these 12 cases 7 were found benign and 5 were malignant. There were 26 cases which had score of 7 and more all these cases were found malignant on the final diagnosis.



Graph 11 : Modified Triple Test score

On final comparison of the various scores it was observed that 27 out of 100 cases with clinical score of 1 were found to have concordant report in USG and FNAC and all were benign. However the out of 39 cases which looked clinically suspicious only 7 were malignant and 32 cases were benign. Out of 34 cases which were clinically malignant 27 were found out to be malignant and 7 cases were benign on final diagnosis. It was that FNAC and USG had high concordance in cases of benign and malignant diseases. All the cases with BIRADS 5 were found malignant in the final diagnosis. Out of 60 cases only one case with BIRADS 2 and USG score of 1 was found Malignant on FNAC. 11 out of 19 cases with USG score of 2 (BIRADS 3 or 4) were found malignant of final diagnosis. The FNAC was performed in all the cases and Histo-pathological examination was done in all the cases where biopsy was performed. The definitive procedures were performed in 32 cases where FNAC was malignant. Among the 4 cases of atypical reporting excision biopsy was performed. 1 out of these 4 cases was found out to be malignant and rest 3 cases were benign.



Graph 12: Comparison of Clinical score/ FNAC score/ USG score

Discussion

Breast Cancer is one of the major causes of mortality in middle aged women unless screened, evaluated and treated early. With increasing knowledge & incidence in intermediate and low risk populations of this part of the world, the patients are presenting at an earlier age^{16,17,18}. The tumours in women under 40 years of age tend to behave more aggressively as compared to older patients¹⁹. The detection of cancerous lesions becomes difficult in younger women owing to the more firm and more cystic (glandular) consistency of these breasts²⁰. With increasing public awareness, patient expectations for a successful and efficient management 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^{21,22}. The MTTs scoring system substitutes ultrasonography for mammography in women younger than age 40 years. The scoring system derived in this series for diagnosing breast masses using the MTTs is identical to that derived for the TTS. 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.

In the present study, The modified triple test score was calculated for all the cases. 64 out of 100 cases had score less than 4. All the cases with score 4 or less than 4 were found benign on FNAC and final diagnosis. There were 12 cases which had score of 5. Of these 12 cases 7 were found benign and 5 were malignant. There were 26 cases which had score of 7 and more all these cases were found malignant on the final diagnosis.

Multiple studies have shown that a mass with a concordant benign triple test result can be safely followed up without open biopsy. This is especially helpful in evaluating low-risk masses or multiple masses in a young patient. Similarly, patients with a concordant malignant triple test result can safely proceed to definitive therapy, without undergoing an open biopsy^{23,24,25-27}.

In our study, this pattern was found in 26 patients who directly proceeded to definitive procedure, avoiding any open biopsy. We also found that the modified triple test had a diagnostic accuracy rate of 100% among patients with concordant malignant or benign results. Thus, a concordant triple test result can guide treatment with 100% accuracy. In non-concordant cases, we found that FNAC was the single most important investigation to confirm the diagnosis, with high sensitivity, specificity and positive predictive values.

Jin Young Kwak, Et al (2006) studied the application of the Breast Imaging Reporting and Data System Final Assessment System in Sonography of Palpable Breast Lesions and Reconsideration of the Modified Triple Test they studied 160 palpable lesions of the breast in which follow-up palpation-guided FNAC, targeted sonography, and pathologic confirmation were performed. They concluded that The diagnostic accuracy of sonography was similar to that of palpation-guided FNA for not missing the malignancy²⁴. In our study also the results of FNAC and USG and have

high sensitivity for malignancy which are similar to the findings of Jin Young Kwak Et al .

The results of our study are comparable to the study done by R. D Jayakar et al (2013) 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. They concluded that 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 biopsy²⁸.

Similar study by Vetto et al¹² which included 55 younger women with palpable breast lumps assessed by MTT yielded high diagnostic accuracy, which also led to avoidance of routine open biopsy resulting in an overall cost reduction.

In our study most (56%) of the patients were younger (<40yr) and presented with breast lumps of varying size. The overall sensitivity, specificity and accuracy of the modified triple test in our study was 97.8%, 88% and 93.7% respectively.

Thus MTTs provides equivalent diagnostic effectiveness but substantially lower cost than traditional management.

Conclusion

The management of breast mass in young females is influenced by Physical examination, breast imaging by sonography/Mammography and Fine Needle Aspiration Cytology.

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 accurately diagnosed more than 94% of the patients without the need for further investigation. The Modified triple test score had a substantial agreement with histopathological report 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, non invasive with no environmental risks and no side effects.

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