

Evaluation of modified triple test in the assessment of palpable breast lumps

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Abstract: To find out the accuracy of the modified triple test in the diagnosis of palpable breast lumps. This was a prospective observational study involving 100 female patients attending surgical out patient department of Coimbatore medical college hospital between July 2016 to June 2017 who underwent clinical breast examination, ultrasonogram and FNAC. All cases underwent surgery in the form of excision biopsy for benign lesions and modified radical mastectomy for malignancy. The final HPE report were considered. The modified triple test in our study was an accurate predictor for the diagnosis of breast lumps.

Key words: triple test, ultrasonogram, fine needle aspiration cytology

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I. Introduction

The commonest mode of presentation of diseases of the breast is “lump”. Palpable mass in a women’s breast could be a benign or malignant lesion and requires prompt evaluation. Correct pre operative diagnosis is essential for planning treatment optimally. The primary aim is to confirm or exclude malignancy. A single test could not be accurate enough. Hence triple test assessment was started in the late 1970’s for assessment of breast lumps, which included clinical breast examination, ultrasonogram and FNAC. The aim of the study were to evaluate the accuracy of triple assessment in the preoperative diagnosis of breast cancer and find out the performance characteristics of breast examination, ultrasonogram and FNAC in isolation and when combined keeping histopathological examination as the reference standard.

II. Materials and Methods

This prospective observational study was carried out on patients of Department of general Surgery at Coimbatore medical college hospital, Tamilnadu from July 2016 to June 2017. A total 103 female patients with palpable breast lump were included in this study.

2.1 Study centre

Department of General Surgery, Coimbatore Medical College Hospital, Coimbatore.

2.2 Period of Study

From July 2016 to June 2017 – 1 Year.

2.3 Patient population

103 consecutive patients presenting to the outpatient and Inpatient department of the Department of General surgery, Coimbatore Medical College with complaints of a palpable breast mass were included in this study.

2.4 INCLUSION CRITERIA:

1. Female patients with age of > 20 years with palpable Breast lump
2. Patient willing for lump excision

2.5 EXCLUSION CRITERIA:

1. Patients who are below 20 years.
2. Male patients

3. Female patients with advanced disease which makes the diagnosis obvious
4. Patients not willing for lump excision

The study was conducted after obtaining permission from the Institutional Ethics Committee. The patients were clearly explained about the nature of study and its implications and an informed written consent was obtained from the patients after explaining the procedure in their vernacular language.

2.6 Collection and accumulation of Data

The patients were enrolled in the study after applying the inclusion and the exclusion criteria. A detailed History regarding the complaints, the mode of presentation, site of lump and associated symptoms was obtained, a complete physical examination and examination of the breast and the mass was made. Each patient underwent a modified triple test which included a complete clinical examination, next was the ultrasound examination of the breast mass and finally Fine Needle aspiration of the breast lump was made. Based on each test the palpable breast lumps were classified as benign, malignant or inconclusive

Malignant lesions: these lesions are ill defined. These are hard in consistency with angulated and abrupt borders and microcalcification seen in Ultrasound examination

Benign Lesions: These lesions may be cystic lesions or solid lesions

Cysts are oval or round with clearly defined margins and they are not echogenic, these cysts may be simple cysts with through and through transmission of echoes or may be abscesses with septations and internal echogenicity.

Solid benign lesions may be fibroadenomas which may be lobulated with single to several lobulations, rounded or oval in shape and covered by a pseudo capsule and has uniform homogenous echo pattern in Ultrasound. Fibroadenosis is a condition in which there is increase in fibrous and glandular elements of the breast not confined to any area sometimes there may be certain cystic areas with increased echogenicity and the architecture of the breast is maintained.

Breast Examination included examination of the breast, the axilla on both sides, both supraclavicular fossa and all lymph node areas were examined to rule out generalized lymphadenopathy.

2.7 Ultrasound examination of breast

Ultrasound examination of the breast was done using a high frequency linear transducer (7.5 to 10 megahertz) in the department of Radiology, Coimbatore Medical College Hospital, Coimbatore by an experienced radiologist well versed with radiological examination of the breast and the patients were examined in supine position and scanning of the breast was done horizontally and vertically, Ultrasound examination of both breasts, axillary region and supraclavicular lymph nodes was also done.

2.8 Fine needle aspiration cytology

FNAC was done by a pathologist and aspiration was done using a 22- 23 gauge needle attached to a 10 ml syringe with the patient in supine position and the ipsilateral upper limb raised beside the head, the lesion was fixed with one hand and the biopsy needle was inserted into the lump and moved back and forth into the mass several times, while constant negative suction was maintained until aspirate was seen at the hub of the needle, then suction was released and the needle withdrawn and the material was spread on three slides, then taken up for cytological examination after fixation and staining. The results were reported as benign, malignant or indeterminate.

2.9 Histopathological examination

All the patients had some form of surgery based on the result of the modified triple test, patients with benign lesions had excision biopsy and malignant lesions had Modified Radical Mastectomy, the surgical specimens were examined in the pathology department and the results were classified as benign or malignant.

2.10 Analysis and interpretation of data

The particulars in the pro forma were tabulated in Microsoft excel program and statistical analysis was done using SPSS software system and appropriate statistical tests were used as necessary and various parameters were analyzed and result of the modified triple test were analyzed individually and collectively, finally the result was compared to Histopathological diagnosis.

Fine Needle aspiration Cytology was reported and tabulated as follows:

- a. Inadequate material - The aspirate had poor cellular content and was not sufficient for cell type assessment.
- b. Benign cytology – Adequate aspirate with benign appearing cells indicating the diagnosis of fibrocystic disease of breast or a Fibroadenoma.

c. Atypical cell cytology – Minimal atypia; which was interpreted as benign breast lesion.
 d. Suspicious cytology - Malignancy – suspect cells with features of malignancy and non interpretable cytology.
 The interpretation of results was done as follows

- 1.Repeat cytology
- 2.Benign lesion
- 3.Malignant lesion
- 4.Inconclusive test

The patients with benign and inconclusive lesions underwent an excision biopsy and the patients with report as malignancy were subjected to modified radical mastectomy, the excision biopsy and mastectomy specimens were subjected to histopathology examination and the results were recorded and compared to the results of the Modified triple test.

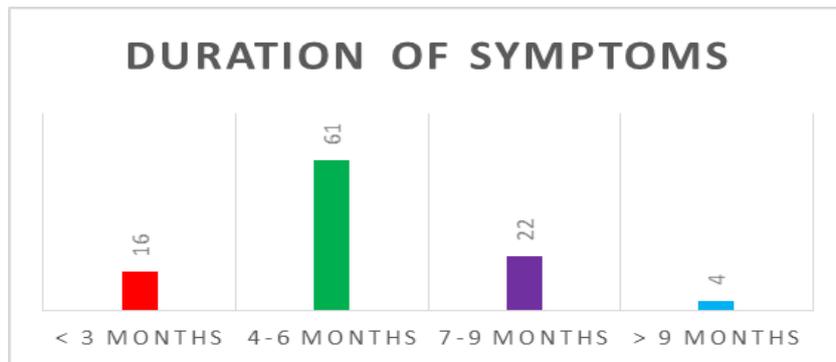
III. Result

After application of inclusion and exclusion criteria 103 female patients were included for the study. Out of the 103 patients 24 patients were between the age group of 21 to 30 years (23.20%), 47 patients were in the age group of 31 to 40 years (45.60%), 23 patients were in the age group of 41 to 50 years (22.30%), 6 patients were in the age group of 51 to 60 years (5.8%), 3 patients were above the age of 60 years (3.10%).

3.1 Duration of symptoms

Most of the patients 61 out of 103 patients (59.2%) had symptoms for the duration of 4 to 9 months, and only 4 patients out of 103 had symptoms for more than 9 months (3.9%).

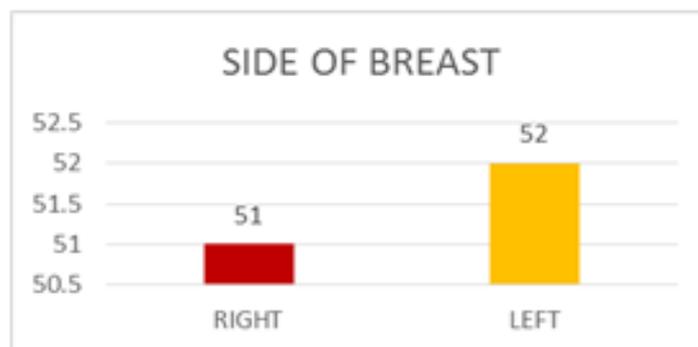
DURATION OF SYMPTOMS	NO OF PATIENTS	PERCENTAGE
< 3 MONTHS	16	15.50%
4-6 MONTHS	61	59.20%
7-9 MONTHS	22	21.40%
> 9 MONTHS	4	3.90%



3.2 Laterality of breast involvement

There was no much difference between the sides with Right side 49.5 % and left sided lesions were 50.5%.

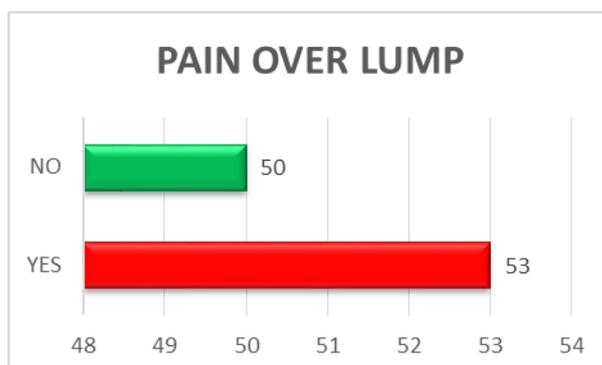
SIDE OF BREAST	NO OF PATIENTS	PERCENTAGE
RIGHT	51	49.50%
LEFT	52	50.50%



3.3 Pain over the lump

53 out of the 103 patients had pain over the lump , of them 8 patients(15%) were found to have malignant disease , 30 patients out of 50 patients (60%) patients with painless lump had malignancies.

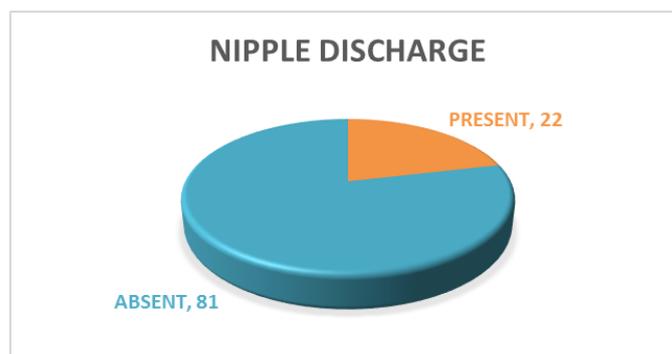
PAIN OVER LUMP	NO OF PATIENTS	PERCENTAGE
YES	53	51.50%
NO	50	48.50%



3.5 Nipple discharge

22 patients out of the total 103 patients presented with nipple discharge (21.3%), of them 17 were found to have malignancy (77%).

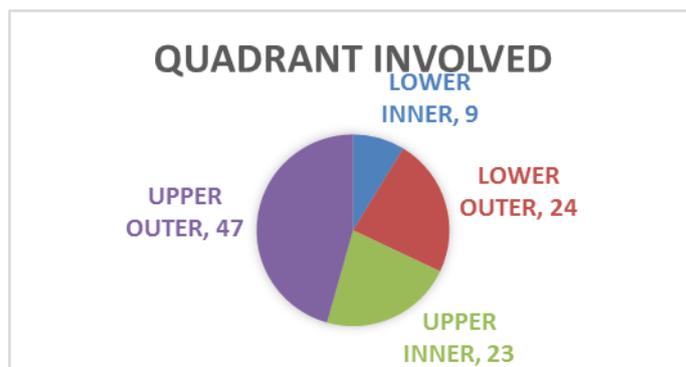
NIPPLE DISCHARGE	NO OF PATIENTS	PERCENTAGE
PRESENT	22	21.30%
ABSENT	81	78.70%



3.6 Quadrant involvement

Upper outer quadrant of the breast was found to be most commonly involved with tumor, 47 out of 103 patients (45.6%) with least involvement seen in the lower inner quadrant, 9 out of 103 patients (8.7%).

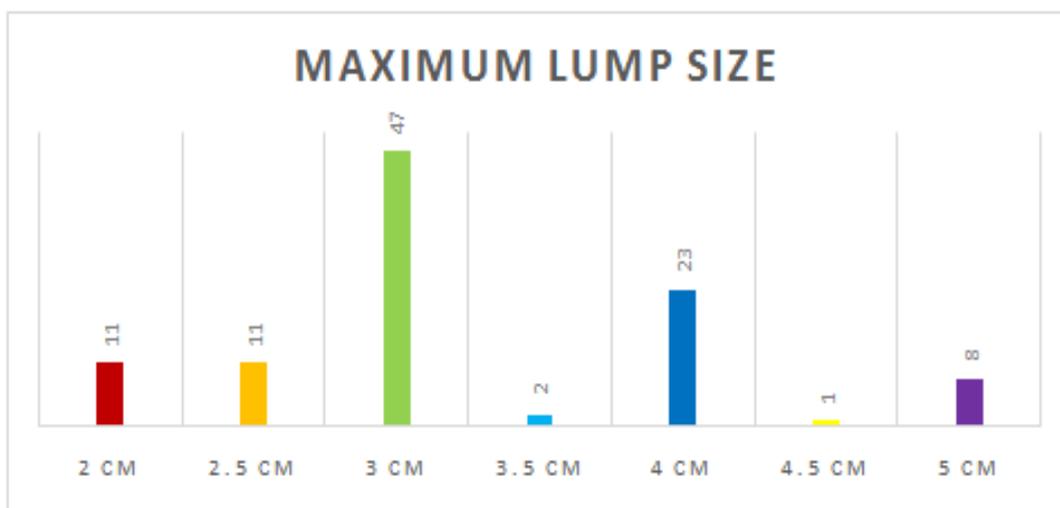
QUADRANT INVOLVED	NO OF PATIENTS	PERCENTAGE
LOWER INNER	9	8.70%
LOWER OUTER	24	23.30%
UPPER INNER	23	22.40%
UPPER OUTER	47	45.60%



3.7 Lump size

A lump size of 3 to 4 cm in maximal diameter was found in 62 out of 103 patients (69%).

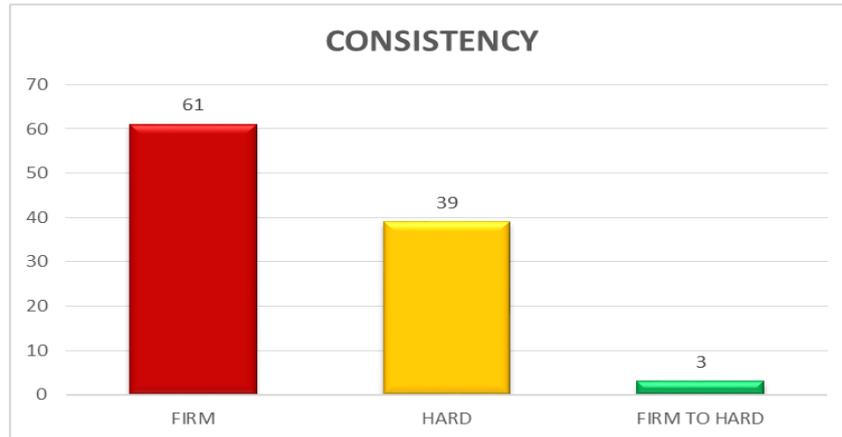
MAXIMUM LUMP SIZE	NO OF PATIENTS	PERCENTAGE
2 CM	11	10.70%
2.5 CM	11	10.70%
3 CM	47	45.60%
3.5 CM	2	1.94%
4 CM	23	22.40%
4.5 CM	1	0.97%
5 CM	8	7.69%



3.8 Consistency

61 out of 103 patients had lumps which were firm in consistency (59.2%) and 39 out of 103 patients had lesions which were hard in consistency.

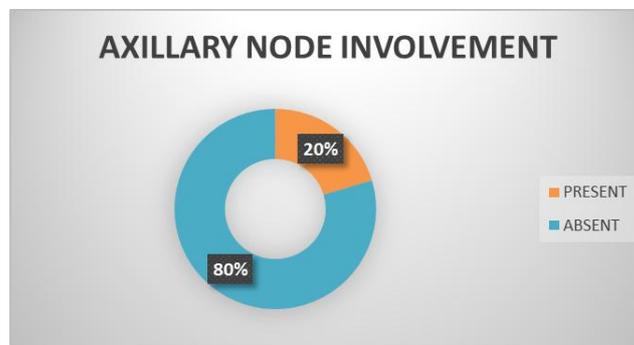
CONSISTENCY	NO OF PATIENTS	PERCENTAGE
FIRM	61	59.20%
HARD	39	37.90%
FIRM TO HARD	3	2.90%



3.9 Axillary Nodal involvement

21 out of 103 patients (20.4%) had axillary node involvement out of the 21 patients 19 had biopsy proven malignancy (90%).

AXILLARY NODE INVOLVEMENT	NO OF PATIENTS	PERCENTAGE
PRESENT	21	20.40%
ABSENT	82	79.60%



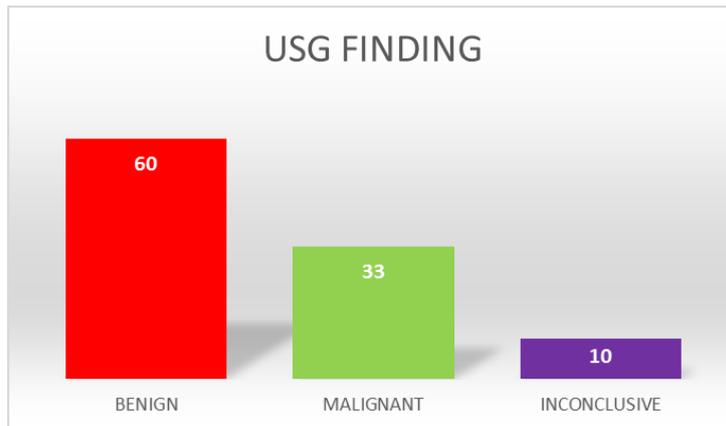
3.10 Clinical Examination findings

33 out of 39 (85%) patients with hard lumps which were clinically suggested as malignant turned out to be malignant, whereas 6 patients with hard lumps had benign disease (15%), 61 patients out of 103 had lumps with firm consistency suggestive of benign lesions of them 2 had malignancy (3.2%).3 patients had lumps with firm to hard in consistency of which all of them were malignant. Clinical examination had a sensitivity of 86.34 % and specificity of 91% for the detection of malignancy. Positive predictive value of Clinical examination was 85% and Negative predictive value was 92.19%.

3.11 Ultrasound findings

60 patients out of 103 (58.2%) had Ultrasound features suggestive of Benign breast lumps and 33 out of 103(32%) had features of malignancy, 10 (9.8%) patients out of 103 had inconclusive features. Of the ultrasonographically suggested benign disease all of them had benign disease by histopathology and all the Ultrasonographically suspected malignant lesions were proven by biopsy to be malignant, of the remaining 10 inconclusive lesions by ultrasound 50% were found to have malignant disease. Sensitivity and specificity of ultra sonogram for the detection of Malignancy was 86.84 % and 100 % respectively. Positive predictive value for detection of malignancy was 100%, Negative predictive value to rule out malignancy was 92.86%.

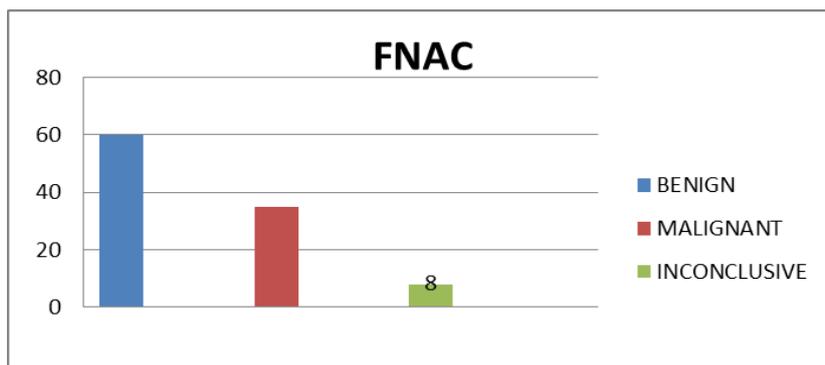
USG FINDING	NO OF PATIENTS	PERCENTAGE
BENIGN	60	58.20%
MALIGNANT	33	32%
INCONCLUSIVE	10	9.80%



3.12 Fine Needle Aspiration Cytology

According to Fine Needle Aspiration Cytology report, 60 patients out of 103 (58.2%) were diagnosed to have benign breast disease, whereas 35 patients (34%) were diagnosed to have malignant disease. 8 (7.8%) patients had inconclusive reports. All patients with FNAC report suggestive of malignancy were biopsy proven to have carcinoma. But 1 out of 60 patients (1.6%) who were reported to have benign disease had malignant disease. Here the FNAC report was fibrocystic disease of breast and the biopsy report turned out to have invasive papillary carcinoma. 2 patients out of 8 (25%) who had inconclusive FNAC reports had malignancy biopsy specimen. Of them 1 patient's FNAC report was proliferative breast disease with atypia and other one's was atypical ductal hyperplasia. Both of them had invasive ductal hyperplasia. Sensitivity and specificity of Fine Needle Aspiration Cytology to detect malignancy were 92.10% and 100% respectively. Positive predictive value was 100% and Negative predictive value was 95.58%.

FNAC	NO OF PATIENTS	PERCENTAGE
BENIGN	60	58.20%
MALIGNANT	35	34%
INCONCLUSIVE	8	7.80%



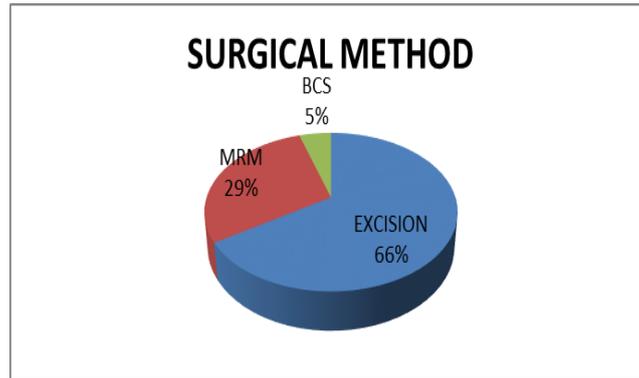
3.13 Modified Triple Test

All 103 patients included in the study were subjected to Modified Triple Test (MTT) and of them 37 patients (36%) had features suggestive of malignant disease and 66 patients (64%) were suspected to have benign breast disease. All 37 patients suspected to have malignancy on Modified Triple Test were biopsy proven to have malignant breast disease, whereas 1 out of 66 (1.5%) patients assigned to have benign disease on Modified Triple Test turned out to be malignant. The sensitivity of modified triple test for the detection of malignancy was 97.36% and the specificity for the detection of malignancy was 100%. The positive predictive value of the Modified triple test was 100% and the Negative predictive value was 98.4%. Thus Modified Triple test was demonstrated to be a very efficient screening test for the detection of breast malignancies in palpable lumps.

3.14 Surgical Treatment

All the 103 patients included in study were subjected to some form of surgery like Excision biopsy, Breast conservation surgery (BCS), or Modified Radical Mastectomy (MRM). 68 patients were subjected to Excision biopsy. 5 patients (4.90%) were treated with BCS as they were eligible for the same. 30 patients (29.10%) underwent Modified Radical Mastectomy.

SURGICAL METHOD	NO OF PATIENTS	PERCENTAGE
EXCISION	68	66%
MRM	30	29.10%
BCS	5	4.90%



3.15 Histopathology findings

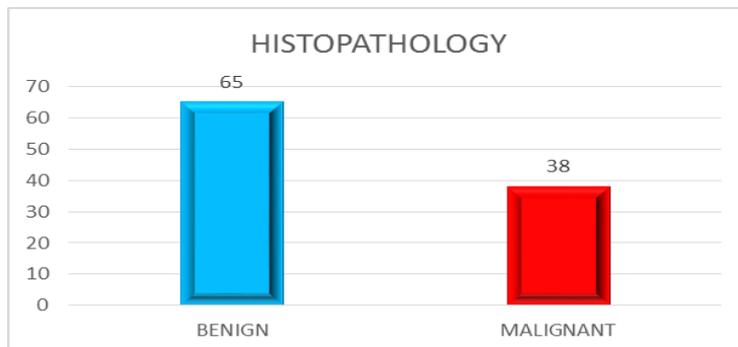
Malignant lesions

38 patients out of 103 had biopsy proven malignancy. Of the malignancies proven by histopathology (38 patients), 29 patients had (76.3%) had 3 patients (7.8%) had ductal carcinoma insitu, 2 patients (5.3%) had invasive papillary neoplasm, 2 patients (5.3%) had mucinous carcinoma, 1 patient (2.65%) had invasive lobular carcinoma, 1 patient (2.65%) had inflammatory carcinoma of breast.

Benign lesions

65 out of 103 patients had benign lesions as seen by histopathology. Fibroadenoma was the most common benign breast tumor, seen in 35 out of 65 patients (53.8%), next common benign lesion was fibrocystic disease which was seen in 17 out of the 65 patients (26.4%). 7 patients (10.8%) patients had benign phylloides tumour. Multiple intraductal papilloma was seen in 2 patients (3%). Breast abscess was found in 2 patients (3%). Solitary intraductal papilloma was seen in 1 patient (1.5%). Tubular adenosis was seen in 1 patient (1.5%).

HISTOPATHOLOGY	NO OF PATIENTS	PERCENTAGE
BENIGN	65	63.10%
MALIGNANT	38	36.90%



IV. Discussion

Breast lumps are one of the commonest findings in women attending surgical clinics, presence of a lump invokes a sense of fear and insecurity among these women and all the lumps are believed to be malignant, since breast malignancy is very much amenable to curative treatment when detected early, so it becomes essential that malignancy is detected at earlier stages to allay fear and institute early treatment. Multimodal investigations are therefore used for the preoperative detection of malignancy. Of these tests the triple test consisting of Clinical examination, mammography and Fine needle aspiration cytology has been used with fairly accurate results and the modification of this test using ultra sonogram of breast instead of mammogram has been used for the early detection of malignancy and is evaluated in our study. The primary aim of this modified triple test is to make an accurate preoperative diagnosis, thereby avoiding unnecessary surgeries in case of a benign breast lump.

Our study tries to evaluate the efficiency of the modified triple test (i.e. Clinical Breast examination, Ultrasound of breast and FNAC) as isolated tests and as a combination for the detection of malignancy, in this study Histopathological examination of the breast lump was used as the reference standard for comparison.

In a retrospective study done by Gobler et al 207 patients with palpable breast masses were examined and it was concluded that if the result of combined evaluation consisting of a triple test of clinical examination, mammography and cytology were concordant, a diagnostic accuracy was 100 % and with discordant results 75% of masses were malignant. Gobler arrived at a conclusion that preliminary surgical biopsy and frozen section of the lesion may not be all that necessary when the triple test unequivocally identifies malignancy.

In a systematic review of 15 studies in which the triple test was used for the diagnosis of palpable breast lumps, a combination of the three tests is consistently more sensitive than a single test, and the capability of identifying malignancy approaches 95 to 100 % when at least one component of the triple test is positive. When all the components of the triple test are in agreement, the probability that the diagnosis is right is approximately 99% whether it is positive or negative diagnosis. This has given us an information that the triple test and its modifications is a dependable, feasible and accurate test for the diagnosis and treatment of palpable breast lumps, and its efficiency is equivalent to open biopsy and it has the advantages of less cost and time and single visit, it also helps us to prevent unnecessary surgical procedures thereby reducing morbidity. The triple test is an accurate test if done by experienced operators and if the results are assessed correctly. In a prospective study involving 200 women with palpable breast tumors using the triple test done by Crone et al clinical examination, mammography and FNAC was done and the results were analyzed alone and in combinations, all the tumors were subjected to excision biopsy, out of the 200 lesions 38 lesions were found to be malignant. In this test even though the triple test was found to be accurate there was a statistical possibility of overlooking a few malignant lesions, so it was concluded that all the palpable breast lumps should be excised. The same point was emphasized by Donegan and Dennis who believed that a solid breast mass always requires a firm diagnosis and should be excised for histological diagnosis. Jin Young Kwak, et al in a 2006 study investigated 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 in this study they followed up 160 palpable breast lesions and subjected the lesions to palpation-guided FNAC, targeted sonography, and then histopathologic confirmation was done. It was shown in this study that Ultrasonography of breast was as accurate as palpation guided Fine needle aspiration for not missing the diagnosis of malignancy. In a study done in 55 young women with palpable breast lumps done by Veto et al, the Modified triple test was used and it was shown to have a high diagnostic accuracy for the detection and differentiation of malignancy. Thereby it suggested that the modified triple test helps to avoid unwanted surgery and also is cost effective. A large multicenter study supported by the Avon Foundation and the National Institutes of Health was created through the American College of Radiology Imaging Network. In this project, a protocol to assess the efficacy of screening breast ultrasound was implemented in 14 imaging centers to better define the role of US in breast cancer screening. The study reported higher cancer detection in high-risk women that underwent annual ultrasound screening in addition to mammography compared to those that underwent mammography alone. The first ultrasound system was approved in 2012 by the US FDA for the screening of breast cancer in conjunction with mammography, especially for women with dense breast tissue and was also indicated in women with a negative mammogram, no symptoms of cancer breast and with no prior history of biopsy or breast surgery. Stavros et al put forth a scheme for classification of breast nodules as benign, indeterminate or malignant using Ultrasound findings.

In the light of the above information we discuss the results of our study, our study was an observational study and 103 patients were subjected to the study. In our study breast lumps were commonly seen in the age group of 31 to 40 years (45.6%) and least commonly seen after the age of 60 years, this is similar to the distribution seen in other studies. Younger aged women have more education standards and awareness that lead them to present earlier in the course of disease. About 59.2% of all the patients had symptoms for 4 to 9 months which was similar to that seen in few studies but some studies reported shorter duration of symptoms of mean of 3 months (Afsar A Bhatti et al 2010).

Pain over the lump was an important symptom and 60% of patients with painless lumps had malignancy on histopathological examination (30 out of 50) in contrast to 15 % of the patients with painful breast lumps (8 out of 53).

Similar findings were also seen in a study conducted by Kaireinnos et al (BMC public health 2013) and the usual mode of presentation of malignancy was a painless palpable lump.

Of the clinical examination findings nipple discharge was also found to be an important finding of the patients with nipple discharge 77 % (17 out of 22) were found to have malignancy on final histopathological diagnosis, so nipple discharge might serve as an important clue to the diagnosis of malignancy, but many studies have shown that nipple discharge is usually benign and 10 to 15% of the patients with nipple discharge tend to

have malignancy. (Van Zee K J et al Cancer 1998), probably study with a larger sample size would iron out the skewed results seen in our study.

In our study the upper outer quadrant was commonly involved with tumor (45.6%) this was also consistent with the findings with a study done by Khemka et al., Hussain et al., and Khoda et al (JMS 2015). It has been demonstrated that the upper outer quadrant of the breast has more amount of epithelial tissue compared to other quadrants leading to more incidence of tumors. V Axillary lymph node involvement was seen in 20.4 % (21 out of 103) of patients presenting with breast lumps and out of the patients who had axillary nodes 90% (19 out of 21) had biopsy proven malignancy, so axillary node involvement is a strong predictor that the tumor is malignant, this has also been recorded by Voss M et al (J SurgOncol. 1999). It has been concluded in the study that patients with stage 3 breast cancer have a higher incidence of axillary metastasis and well differentiated tumors tend to metastasize slowly. So axillary involvement may be a pointer towards advanced or fast growing malignancy and should prompt immediate attention.

When the clinical examination findings were examined as a whole clinical examination had sensitivity of 86.34 % and specificity of 91% for the detection of malignancy .Positive predictive value of Clinical examination was 85% and Negative predictive value was 92.19%. On analysis of various studies

It has been shown that sensitivity of the Clinical breast examination ranges from 21% to as high as 100% and the specificity ranges from 50% to 97.8%. In the present study, the high sensitivity could be because only patients with confirmed palpable lumps were included for the study. Our results are in concordance with many studies.

Ultrasonography of breast

The triple test used mammography as one of its components and mammogram had a sensitivity of 87% for malignancy detection. Crystal et al (2003), Susan k et al (2005), Corsetti et al (2006) and Sahiner et al (2007) had supported the use of USG in young patients with dense breast tissues and ultrasound was found to have a sensitivity of 89% in detecting symptomatic and palpable breast abnormalities.

Though relatively a fresh modality ultrasound has gained widespread popularity due to easy availability of the equipment, it is less expensive and is non invasive and can provide accurate information in tumors more than 2mm. Both USG and mammography have their inherent advantages and disadvantages that have been discussed in literature. But in the current scenario USG has gained the acceptance among the medical fraternity and is included in the screening for malignant lesions of breast as a part of the modified triple test and its results are adequately validated by many studies.

In our study 33 out of 103 patients had ultrasound findings suggestive of malignancy; out of them all had biopsy proven malignancy. Ultrasound had a sensitivity of 86.84% and specificity of 100% for the detection of malignancy, Positive predictive value for detection of malignancy was 100%, Negative predictive value to rule out malignancy was 92.86%.

These findings when compared to available literature shows good correlation and in a study done by Khoda et al USG, sensitivity was 91.6%, specificity was 100%, positive predictive value was 100%, negative predictive value was 97.3%, Similarly in a study done by Pande et al sensitivity, specificity, positive predictive value and negative predictive value for ultrasonography were 95%, 94.1%, 95.5%, and 93.7%, respectively. Another study by Jan et al also yielded similar results.

A sensitivity of 86.84 % means 13.16 malignant lesions would be missed out of 100 malignant lesions, so the diagnosis of a benign lump always does not mean that it is benign and it would need a combination of tests to confirm it, but nonetheless USG of the breast is a valuable and easy tool for the detection of malignancy. Fine Needle Aspiration Cytology

In our study Fine Needle aspiration classified, 60 patients out of 103 (58.2%) as having benign breast disease, whereas 35 patients (34%) were diagnosed to have malignant disease. 8 (7.8%) patients had inconclusive reports. All patients with FNAC report suggestive of malignancy were biopsy proven to have carcinoma. But 1 out of 60 patients (1.6%) who were reported to have benign disease had malignant disease. Sensitivity and specificity of Fine Needle Aspiration Cytology to detect malignancy were 92.10% and 100% respectively. Positive predictive value was 100% and Negative predictive value was 95.58%. FNAC results in various studies

Study	Sensitivity %	Specificity%	Positive predictive value%	Negative predictive value %
Our study	92.10	100	100	95.58
Sankaya&Dongre	88.37	96.42	97.43	84.37
Choi et al	77.70	99.20	97.43	84.37
Mohammed et al	90.62	100	100	95.08
Kim et al	94.59	87.91	79.54	97.03
Park and Ham	76.90	91.60	-	-

It is shown that the results of our study are comparable to various studies and the values closely resemble the results seen by Mohamed et al. So the results indicate that FNAC as an independent variable has adequate diagnostic power and this is further enhanced by combination with other 2 tests.

The Modified triple test analysis

Using modified triple test 37 patients (36%) had features suggestive of malignant disease and 66 patients (64%) were suspected to have benign breast disease. All of the 37 patients suspected to have malignancy on Modified Triple Test were biopsy proven to have malignant breast disease, where as 1 out of 66(1.5%) patients assigned to have benign disease on Modified Triple Test turned out to be malignant. The sensitivity of modified triple test for the detection of malignancy was 97.36% and the specificity for the detection of malignancy was 100%. The positive predictive value of the Modified triple test was 100% and the Negative predictive value was 98.4%.

Comparison of Studies using modified triple test :

Study	Sensitivity %	Specificity%	Positive predictive value%	Negative predictive value %
Our study	97.36	100	100	98.40
Baykara et al	100	92.01	53.16	100
Khoda et all	100	100	100	100
Jan et al	100	99.3	93.3	100
Vaithyanathan et al	100	82	76.9	100

This comparison shows that our results were comparable to the results seen in many studies and it has shown that the modified triple test can be used as a valuable clinical test for the detection of malignant lumps and it helps us to plan the surgical treatment earlier, accurately and helps us save time needed for a definitive diagnosis

V. Conclusion

The modified triple test is valid and reliable. The high degree of accuracy for the diagnosis of breast lumps. Of all the 3 components of the triple test FNAC is the most accurate. All the three components complimented each other and when done can reduce the time lack for the detection of malignancy and help us institute early definitive treatment.

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