



General Surgery

A STUDY ON MODIFIED TRIPLE ASSESSMENT (CLINICAL BREAST EXAMINATION, ULTRASONOGRAPHY, AND FINE-NEEDLE ASPIRATION CYTOLOGY) IN THE DIAGNOSIS OF PALPABLE BREAST LUMPS

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ABSTRACT The commonest mode of presentation of breast diseases is "lump." It could be a benign or malignant lesion and it requires a prompt evaluation. The primary aim is to confirm or exclude cancer. A single-modality test is not accurate to make the correct diagnosis, it can be increased by employing multimodality tests. **Methods:** A total of 50 patients of clinically palpable breast lump and age more than 18 years, attending the Surgical Out Patient Department of general surgery, SRMC, Nandyal from AUGUST 2024 to JANUARY 2025, were included in the study. **Results:** A total of 50 female patients with clinically palpable breast lump attending the surgical Out Patient Department were included for study. The age range was 18-60 years and the mean age of breast lump 38 years. Of the 16 patients with malignant breast lumps, patients were 30 years and older. The mean age of patients with breast cancer was 37 years. **Conclusion:** The modified triple test is valid and reliable, with a high degree of accuracy for the diagnosis of breast lumps. Of all the three components of the triple test, FNAC is the most accurate. A patient with a concordant benign triple test report can be safely followed up without the need for biopsy. The aim of the modified triple assessment is to allow the clinician to avoid unnecessary incisional biopsy and to proceed to definitive therapy if a malignant breast lump is present. In summary, the modified triple test can reliably guide the evaluation and treatment of breast lumps.

KEYWORDS : CBE, USG, FNAC, HPE, Breast Lump, Excisional or Incisional Biopsy, Diagnostic Accuracy**INTRODUCTION**

The commonest mode of presentation of breast diseases is "lump."^[1] It could be a benign or malignant lesion and it requires a prompt evaluation. The primary aim is to confirm or exclude cancer. A single-modality test is not accurate to make the correct diagnosis, it can be increased by employing multimodality tests.

AIMS & OBJECTIVES

The aim of this study is to know the accuracy of triple assessment in the preoperative diagnosis of breast cancer and to find out the performance characteristics of

- Clinical breast examination (CBE)
- Ultrasonography (USG),
- Fine Needle Aspiration Cytology (FNAC)
- in isolation & combined, keeping Histo-Pathological Examination (HPE) as the reference standard.

METHODS & MATERIALS

A total of 50 patients of clinically palpable breast lump and age more than 18 years, attending the Surgical Out Patient Department of general surgery, SRMC Nandyal from AUGUST 2024 to JANUARY 2026, were included in the study.

Exclusion Criteria

Already diagnosed case of breast cancer, Patient with multiple breast lumps, inflammatory conditions of breast, previous history of surgery on the same side of breast. A thorough history was taken for each subject, followed by CBE, USG, and FNAC.

Clinical Breast Examination :

Done in opd, including a search for lymphadenopathy in the axilla and supraclavicular fossa on both sides. Examination findings were recorded as benign, indeterminate, and suggestive of malignancy of breast lump.

UltraSonoGraphy:

Done using 10-14 MHz probe (SIEMENS, Sonoline Versa Plus, Department of Radiology, SRMC, Nandyal.) Scanning of breast was done systemically by obtaining vertical and horizontal scans. Findings were coded as benign, indeterminate, or suggestive of malignancy.

Fine Needle Aspiration Cytology:

Done using a 21-22 gauge needle attached to a 10 mL syringe. The cellular material was expressed on a slide, spread and air-dried, and sent to the Pathology Department for cytological examination. Reports were then coded as benign, indeterminate, or malignant.

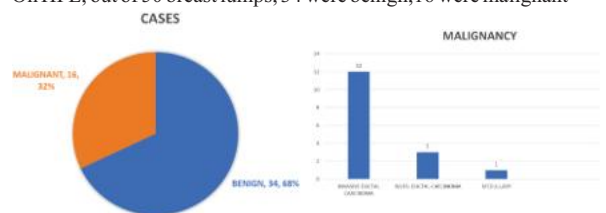
Histo Pathological Examination:

All the cases irrespective of results underwent either excisional or incisional biopsy and specimens were sent in 10% formalin solution to the pathology department for HPE. The final histopathological report was considered as the reference standard. Reports were then grouped into "benign" and "malignant" for analysis.

RESULTS

A total of 50 female patients with clinically palpable breast lump attending the surgical Out Patient Department were included for study. The age range was 18-60 years and the mean age of breast lump 38 years. Of the 16 patients with malignant breast lumps, patients were 30 years and older. The mean age of patients with breast cancer was 37 years.

On HPE, out of 50 breast lumps, 34 were benign, 16 were malignant



The study compares the diagnostic performance of clinical breast examination (CBE), ultrasonography (USG), fine needle aspiration cytology (FNAC), and triple assessment against histopathological examination (HPE). For CBE, out of 47 cases, 30 benign cases were correctly identified with 1 false positive, while 15 malignant cases were correctly diagnosed with 1 false negative. FNAC showed 34 true benign cases with 1 false positive and all 15 malignant cases correctly identified, totaling 50 cases. USG demonstrated 29 true benign cases with 1 false positive and 11 true malignant cases with 2 false negatives, out of 43 cases. Triple assessment achieved perfect correlation with HPE, identifying all 30 benign and 13 malignant cases accurately, with no false results.

In terms of diagnostic metrics, CBE showed a sensitivity of 96.77%, specificity of 93.75%, positive predictive value (PPV) of 96.77%, negative predictive value (NPV) of 93.75%, and overall accuracy of 97%. USG had a sensitivity of 96%, specificity of 91.66%, PPV of 96.66%, NPV of 84.61%, and accuracy of 96.5%. FNAC demonstrated higher performance with 100% sensitivity, 93.75% specificity, 97.14% PPV, 100% NPV, and 99% accuracy. Triple assessment showed the best results with 100% sensitivity, specificity, PPV, NPV, and accuracy.

indicating it as the most reliable diagnostic approach among the methods compared.

DISCUSSION

Breast cancer is the most common cancer in women worldwide. The employment of multimodality tests preoperatively for diagnosis helps in differentiating benign from malignant lesions. The primary goal of the triple test is to make the correct preoperative diagnosis, avoiding incisional biopsy in case of a benign breast lump.

Lump Detected in:

Upper outer quadrant of breast - 27 (54%) patients, Upper inner quadrant - 12 (24%), Remaining 13 (26%) in other quadrants of breast. Similar observations were made by Khemka et al. and Hussain et al., in whose studies the majority of breast lumps were found in the upper outer quadrant. The relative higher occurrence of breast lump in the upper outer quadrant of breast compared to the other quadrants is because much of the epithelial tissue of breast is present in this quadrant. Of the 31 benign on CBE, 30 were benign and 1 had malignant reports on HPE. Of the 16 malignant on CBE, 15 were malignant & 1 was benign on the HPE. On review of the literature, various studies show the sensitivity of the CBE ranging from 21% to as high as 100% and the specificity from 50% to 97.8%. On FNAC examination, out of 36 benign findings, 35 - benign and 1 - malignant on HPE. All the 15 malignant cases were confirmed on HPE. Our results were in agreement with other studies. Khemka et al. found that FNAC had the sensitivity, specificity, positive predictive value, and negative predictive value of 96%, 100%, 100%, and 95.12%, respectively.

USG is the recommended in younger females because of dense breast tissue. Mammography is recommended for women over 35 years of age. USG favoured malignancy in 13 patients, on HPE 11 - malignant, 2 - benign. Out of 30 benign, 1 turned out to be malignant on histopathology. Pande et al. had found that sensitivity, specificity, positive predictive value, and negative predictive value were 95%, 94.1%, 95.5%, and 93.7%, respectively.^[8] The present study showing a sensitivity of 96% means, 4 would be missed out of 100 malignant lesions. Thus, in case of a benign report, additional testing modalities should be used to rule out malignancy. When triple assessment was compared with the results of histopathology, we found that the three tests concurred in 30 benign and 13 malignant cases, i.e., 43 (86%) patients. When all the three tests concurred, there were no false positive or false negative cases. Sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were all 100%.

Our results compared favourably with the available literature. Ghafouri et al. found that when suspicious results were excluded, the diagnostic accuracy of the modified triple test was 100%. Study by Jan et al., the sensitivity and specificity of triple assessment was 100% and 99.3%, respectively. The concordance for the triple assessment was 99.3%, positive predictive value was 93.3%, and negative predictive value was 100%. Similar findings were noted by Vaithianathan et al. in their study. The diagnostic accuracy rate of the modified triple test in concordant cases (benign and malignant) was 100%. The sensitivity, specificity, positive predictive value, and negative predictive value were found to be 100%, 82%, 76.9%, and 100% respectively.

CONCLUSION

The modified triple test is valid and reliable, with a high degree of accuracy for the diagnosis of breast lumps. Of all the three components of the triple test, FNAC is the most accurate. A patient with a concordant benign triple test report can be safely followed up without the need for biopsy. The aim of the modified triple assessment is to allow the clinician to avoid unnecessary incisional biopsy and to proceed to definitive therapy if a malignant breast lump is present. In summary, the modified triple test can reliably guide the evaluation and treatment of breast lumps.

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