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Original Research Article

CLINICAL AND HISTOPATHOLOGICAL CORRELATION OF BREAST LUMPS WITH DIAGNOSTIC ACCURACY OF TRIPLE ASSESSMENT IN A RURAL TERTIARY CARE SETTING OF KONKAN REGION

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ABSTRACT

Background: Breast lumps represent one of the most common clinical presentations in female patients, with causes ranging from benign fibroadenomas to malignant carcinomas. In rural healthcare settings, reliance on clinical evaluation remains high due to limited access to advanced diagnostics. The objective is to study to study the clinical profile, diagnostic accuracy, and histopathological correlation of breast lumps using the triple assessment approach in a rural tertiary care center.

Materials and Methods: A prospective study was conducted on 100 female patients presenting with palpable breast lumps. Each case underwent clinical examination, mammography, FNAC, and subsequent histopathological evaluation. Diagnostic performance of clinical examination was compared against mammography and FNAC.

Results: Among the study population, 54% had malignant lumps while 46% were benign. Clinical examination demonstrated high sensitivity (96.08% vs. mammography; 96.23% vs. FNAC) and specificity (83.67% and 87.23%, respectively). Invasive ductal carcinoma was the most common malignancy (83.35%), and fibroadenoma was the most frequent benign lesion (41.3%). Majority of malignant cases were staged as IIIA or higher.

Conclusion: Triple assessment remains a reliable diagnostic method for breast lumps. In resource-limited rural settings, clinical examination plays a critical role in early diagnosis and guiding management decisions.

Keywords: Breast Lump, Clinical Examination, FNAC, Mammography, Histopathology.

INTRODUCTION

Breast lumps are among the most frequently reported complaints in female patients, second only to breast pain. Their etiology ranges from benign lesions such as fibroadenomas to malignant tumors, with significant variations in clinical presentation across age groups. Early and accurate diagnosis is critical for improving treatment outcomes and survival rates. In many healthcare settings, especially rural areas, access to advanced imaging and pathological services may be limited, placing greater reliance on clinical examination. The standard approach to diagnosing breast lumps involves a triple assessment: clinical evaluation, imaging (usually mammography), and cytological analysis through fine needle aspiration cytology (FNAC).[1,2] Each component contributes uniquely to diagnostic precision, yet discrepancies may arise. Studies have shown varying degrees of sensitivity and specificity among these modalities, underlining the importance of context-based clinical judgement. This study aims to evaluate the diagnostic accuracy of clinical examination in comparison with

mammography and FNAC, with histopathology serving as the reference standard.[3-5]

MATERIALS AND METHODS

This prospective observational study was conducted at the Department of General Surgery, B.K.L. Walawalkar Rural Medical College and Hospital, Maharashtra, over a period from December 2023 to June 2025. A total of 100 female patients presenting with palpable breast lumps were enrolled based on inclusion and exclusion criteria. Inclusion criteria comprised all female patients presenting to the surgery or gynecology outpatient departments with a clinically detectable breast lump. Exclusion criteria included patients unwilling to participate, those with immunocompromised status, significant comorbidities, superficial skin lesions (e.g., sebaceous cysts, papillomas), or prior organ failure.
Detailed clinical history including age, duration of symptoms, family history, reproductive history, and contraceptive use was recorded. Each patient underwent a thorough physical examination including assessment of lump size, location, consistency, mobility, and skin or nipple changes. Imaging via mammography and FNAC was performed for all patients as part of the triple assessment protocol. Final diagnosis was established through histopathological examination of excised tissue following surgery. All data, including clinical findings, diagnostic tests, treatment modality, and follow-up outcomes, were systematically recorded. Patients were monitored postoperatively at 2 weeks, 3 months, 6 months, and 12 months intervals. Ethical clearance was obtained, and written informed consent was secured from all participants.

RESULTS

Among the study population, 54% had malignant lumps while 46% were benign. Out of 54 patients with malignant lumps, 49 underwent Modified Radical Mastectomy (MRM), and 5 underwent Breast Conservation Surgery (BCS), indicating a predominance of advanced disease requiring radical intervention. [Table 1]
TNM staging showed that most patients were diagnosed at Stage IIIA (27.78%), followed by Stage IIB and IIIC (22.22% each). Only a small percentage were diagnosed at Stage I (3.7%) and Stage IV (1.86%), reflecting delayed presentation. [Table 2]
Clinical examination demonstrated a sensitivity of 96.08% and specificity of 83.67% compared to mammography, with an accuracy rate of 90%. This shows that clinical assessment remains a valuable diagnostic tool in rural settings. [Table 3]
When compared with FNAC, clinical examination showed a sensitivity of 96.23%, specificity of 87.23%, and diagnostic accuracy of 92%, confirming its reliability when used as part of triple assessment. [Table 4]
When comparing clinical examination to mammography, clinical examination demonstrated a high sensitivity (96.08%) and a moderate specificity (83.67%) in detecting malignant breast lumps when compared with mammography. [Table 5]
-Sensitivity = TP / (TP + FN) = 49 / (49 + 2) = 49/51 ≈ 96.08%
- Specificity = TN / (TN + FP) = 44 / (44 + 5) = 44/49 ≈ 89.80%

When comparing clinical examination to FNAC, clinical examination demonstrated a high sensitivity (96.23%) and good specificity (87.23%) when compared with FNAC in the evaluation of breast lumps. [Table 6]

-Sensitivity = TP / (TP + FN) = 51 / (51 + 2) = 51/53 ≈ 96.23%
-Specificity = TN / (TN + FP) = 41 / (41 + 6) = 41/47 ≈ 87.23%

Table 1: Distribution of Study Population with Breast Lump According to Surgical Treatment

Nature Tumour	of	Total Cases	Surgery Type	Number Patients	of
Benign		46	Wide Local Excision	46	
Malignant		54	Modified Radical Mastectomy (MRM)	49	
			Breast Conservation Surgery (BCS)	5	

Table 2: Distribution of Malignant Cases by TNM Staging

Stage	Frequency	Percentage
I	2	3.70%
IIA	7	12.97%
IIB	12	22.22%
IIIA	15	27.78%
IIIB	5	9.25%
IIIC	12	22.22%
IV	1	1.86%
Total	54	100%

Table 3: Comparison of Clinical Examination with Mammography

Parameter	Clinical vs. Mammography
Sensitivity	96.08%
Specificity	83.67%
Accuracy	90%

Table 4: Comparison of Clinical Examination with FNAC

Parameter	Clinical vs. FNAC
Sensitivity	96.23%
Specificity	87.23%
Accuracy	92%

Table 5: Comparison of clinical examination with mammography in diagnosing malignancy in breast lumps-

	Mammography Malignant	Mammography Benign	Total
Clinical examina5on Malignant	49(True Posi5ve)	8(False Posi5ve)	57
Clinical examina5on Benign	2(False Nega5ve)	41(True Nega5ve)	43
Total	51	49	100

Table 6: Comparison of clinical examination with Fine needle aspiration cytology (FNAC) in diagnosing malignancy in breast lumps

	FNAC Malignant	FNAC Benign	Total
Clinical examination Malignant	51(True Positive)	6(False Positive)	57
Clinical examination Benign	2(False Negative)	41(True Negative)	43
Total	53	47	100

DISCUSSION

This study was conducted to evaluate the clinical profile, diagnostic approach, and histopathological correlation of breast lumps in a rural tertiary care setting, with emphasis on the accuracy of clinical examination versus imaging and cytology. Out of 100 patients, 54% had malignant lumps and 46% were benign, with the benign-to-malignant ratio being 1:1.17, which is slightly higher than reported in some earlier studies from urban centers.[6,7] The increased malignant ratio in our cohort may be attributed to late presentation, lack of awareness, and sociocultural barriers common in rural populations.[8]

The majority of malignant cases were found in women aged over 40 years, aligning with established epidemiological patterns.[9] In contrast, benign lesions such as fibroadenomas were more common in younger age groups, particularly between 21–30 years. This age-based distribution supports existing literature indicating that hormonal activity influences the nature of breast lumps.[10]

The most common benign lesion was fibroadenoma (41.3%), while invasive ductal carcinoma (83.35%) dominated among malignant cases. This is consistent with global trends, where these remain the most frequently encountered benign and malignant breast pathologies respectively.[11]

One of the significant outcomes of this study was the validation of clinical breast examination (CBE) as a reliable diagnostic tool. CBE showed a sensitivity of 96.08% and specificity of 83.67% compared with mammography, and 96.23% sensitivity and 87.23% specificity against FNAC. This indicates that, especially in resource-limited rural settings, CBE can effectively guide further diagnostics and management.[12] Mammography, while useful, had limitations in younger women with dense breast tissue, which reduced its sensitivity.[13]

Furthermore, FNAC proved highly effective in preliminary diagnosis but showed some discrepancies when compared with histopathological findings, especially in cases of phyllodes tumour and chronic mastitis.[14] Histopathology remained the gold standard for final diagnosis.

Delayed presentation was common, with 81% of patients reporting to the hospital more than four weeks after noticing a lump. This delay resulted in higher staging at diagnosis, with the majority of malignant cases being Stage IIIA or higher, emphasizing the need for improved screening and awareness programs.[15]

Overall, the results highlight the importance of early detection, community education, and the continued relevance of clinical skills in breast lump evaluation, particularly in underresourced healthcare settings.

Our study is based on limited sample size and limited geographical area therefore indicating that results cannot be generalised universally. the cost factors for higher investigations like PET scan or study of genes does not align with the affordable limits of the sample strata & also its availability in the rural setting.

CONCLUSION

This study underscores the diagnostic value of clinical breast examination as part of triple assessment in breast lump evaluation, especially in rural healthcare setups. A significant proportion of patients presented with malignant lesions at advanced stages, emphasizing the role of early detection and public awareness. Clinical examination demonstrated high sensitivity and specificity when compared with mammography and FNAC, validating its utility. Histopathology confirmed the final diagnosis, reinforcing its role as the gold standard. Strengthening rural diagnostic infrastructure and education programs can improve early detection, reduce disease burden, and improve survival outcomes in breast cancer patients.

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