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Evaluation of mammogram findings of breast lesions with trucut biopsy

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Abstract

Introduction: Breast cancer is the most common malignancy in women and second leading cause of cancer death among women aged 20 to 59 years. Radiological assessment of the breast lesion by diagnostic mammography remains one of the key investigation in the so called triple assessment of breast lesions. Classification of the mammogram findings as BI-RADS score also helps in the study of the lesions by categorising it into benign, suspicious of and suggestive of malignancy[1]. Comparing its results with the gold standard histopathological (TRUCUT) findings confirms the diagnosis and helps to assess the reliability of mammogram in diagnosing the pathology. **Materials and methods:** A cross sectional study was conducted among 66 patients who has clinically suspicious malignant breast lesions, attending the General surgery OPD, Casualty, wards of Calicut medical college during the study period. Statistical analysis of the data performed, results of mammogram and trucut biopsy results are compared and analysed. **Results:** On comparing the mammographic findings to that of the Trucut results 96.96% turned out to be true positive and the rest 3.03% as false positive. Out of the false positive results all were in the category BI-RADS 4a, low suspicion of malignancy (2-9%). In the present study, because the inclusion criteria is "the lesion which are suspicious of malignancy" hence the study population includes only those with results of BIRADS IV - V but not the other categories. **Conclusion:** Since Mammogram helps in easily identifying the breast lesions, even the impalpable ones, also assess the multicentricity and helps in characterisation of breast lumps, results being reproducible and less subjective and non invasive, it can be considered a primary diagnostic tool in the evaluation of breast lesions and a reliable and useful tool in differentiation of malignant and benign breast masses.

Keywords: Breast cancer, Mammogram, BI-RADS.

Introduction

Breast cancer is the most common malignancy in women and second leading cause of cancer death among women[2] .It accounts for 30% of all newly diagnosed cancers in females and is responsible for 14% of the cancer-related deaths in women. Breast cancer has captured the attention of surgeons throughout the ages. The Smith SurgicalPapyrus (3000–2500 BC) is the earliest known document to refer to breast cancer. The cancer was in a man, but the description encompassed most of the common clinical features. In reference to this cancer, the author concluded, "There is no treatment"[3]. In De Medicina, Celsus commented on the value of operations for early breast cancer: "None of these may be removed but the cacoethes (early cancer), the rest are irritated by every method of cure. The more violent the operations are, the more angry they grow"[4].

The increase in breast cancer incidence occurred primarily in women age ≥55 years and paralleled a marked increase in the percentage of older women who had mammograms taken. In any patient who presents with a breast lump or other symptoms suspicious of carcinoma, the diagnosis should be made by a combination of clinical assesement, radiological imaging and a tissue sample taken for either a cytological or histological analysis, the so called triple assessement[5]. The positive predictive value (PPV) of this combination should exceed 99.9%[6]. Mammography has been used since the 1960s, and the techniques used continue to be modified and

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improved to enhance image quality[7].

X-ray screening mammography remains the most sensitive noninvasive technique for detecting early tumors when women are asymptomatic and cancers may still be noninvasive[8]. Conventional mammography delivers a radiation dose of 0.1 cGy per study[9]. By comparison, chest radiography delivers 25% of this dose. However, there is no increased breast cancer risk associated with the radiation dose delivered with screening mammography. With screening mammography, two views of the breast are obtained: the craniocaudal (CC) view and the mediolateral oblique (MLO) view. The MLO view images the greatest volume of breast tissue, including the upper outer quadrant and the axillary tail of Spence. Mammography was more accurate than clinical examination for the detection of early breast cancers, providing a true-positive rate of 90%. Typical features characteristic of invasive malignant carcinoma include evident mass, micro-calcification, architectural distortion or asymmetric density[10]. The presence of fine, stippled calcium in and around a suspicious lesion is suggestive of breast cancer and occurs in as many as 50% of nonpalpable cancers. These microcalcifications are an especially important sign of cancer in younger women, in whom it may be the only mammographic abnormality.

Nonpalpable Lesions, Image-guided breast biopsy specimens are frequently required to diagnose nonpalpable lesions. The combination of diagnostic mammography, ultrasound or stereotactic localization, and fine-needle aspiration (FNA) biopsy achieves almost 100% accuracy in the preoperative diagnosis of breast cancer. Although FNA biopsy permits cytologic evaluation, core-needle permits the analysis of breast tissue architecture and allows the pathologist to determine whether invasive cancer is present. This permits the surgeon and patient to discuss the specific management of a breast cancer before therapy begins. The advantages of core-needle biopsy include a low complication rate, minimal scarring, and a lower cost

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compared with excisional breast biopsy. For a Palpable lesion, core biopsy of a palpable breast mass can usually be performed. A 14-gauge core biopsy needle is used, such as Tru-Cut needle. Tissue specimens are placed in formalin and then processed to paraffin blocks. Although the false-negative rate for core-needle biopsy specimens is very low, a tissue specimen that does not show breast cancer cannot conclusively rule out that diagnosis because a sampling error may have occurred. If the biopsy findings do not concur with the clinical and radiographic findings, the multidisciplinary team (including clinician, radiologist, and pathologist) should review the findings and decide whether or not to recommend an image- guided or open biopsy to be certain that the target lesion has been adequately sampled for diagnosis.

Aim
1. To study the mammogram of patients with suspicious malignant breast lesions
2. To compare the mammogram findings (BI-RADS4 &5) with HPE (Tru-Cut biopsy)

Inclusion criteria: All female patients attending General surgery OPD, casualty, wards who has mammographic diagnosis as BIRADS 4 & 5

Exclusion criteria
1. Patients who are not willing to participate in the study.

Sample size
66

Statistical analysis
- Data assessment will be done by using SPSS software and Microsoft Excel.
- Mammographic findings and its stages and TRUCUT biopsy results were considered as primary explanatory variables. Age, Lymph nodes, size, grades, ER, PR, Her 2 neu, NPI etc., were considered as Secondary explanatory variables
- Descriptive analysis: Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Data was also represented using appropriate diagrams like bar diagram, pie diagram.
- Mammogram findings were compared with TRUCUT results and percentage of true positive (malignant) cases determined.

Results
Among the study population, 19 (28.7%) were BIRADS 4a, 25 (37.87%) were 4b, 14 (21.21%) were 4c and 8 (12.12%) were BIRADS 5.

Table 1: Descriptive analysis of Mammogram stages in the study population (N=66)

Mammogram BIRADS	Frequency	Percentage
4a	19	28.7
4b	25	37.87
4c	14	21.21
5	8	12.12

Among the study population, when the mammographic findings are compared to that of the TRUCUT results, out of 66 patients 64 (96.96%) turned out to be histopathologicaly malignant and remaining 2 (3.03%) found to be benign.

Table 2: Descriptive analysis of Mammogram findings in the study population in comparison with TRUCUT results

Mammogram BI-RADS	Trucut Biopsy Result	
	Malignant	Benign
4a	17	2
4b	25	0
4c	14	0
5	8	0

- 3.03% (2 cases) of the histopathological confirmed benign lesions was found mammographically as BIRADS 4a (low suspicion for malignancy 2-9%).
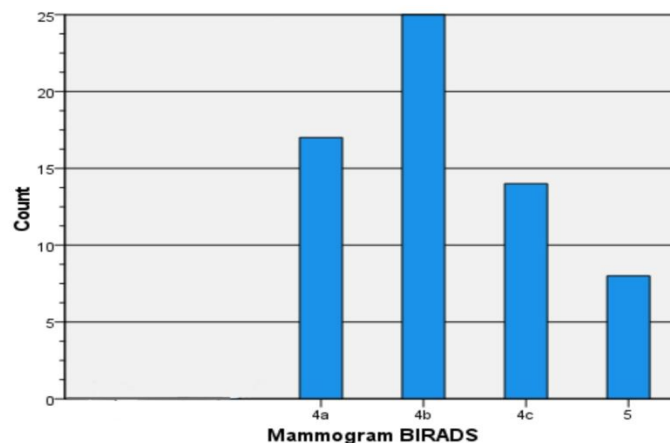

Figure 1: Bar chart of BIRADS stages in the study population (N=66)

Discussion
Management of breast cancer involves the primary investigation diagnostic mammography for identifying the nature of clinically suspicious lesion and followed by confirming it with the gold standard histopathological examination. BI-RADS score being non-invasive, it may become a very useful test for evaluating Breast lump lesions. It's important to have review on the previously established methods of investigation especially in this current scenario of rising trends in breast cancer among women.

The purpose of the present study was to evaluate the diagnostic performance of Mammography in the diagnosis of malignant breast lesions.

- In this study 66 female patients with suspicious breast lesions and fulfilling the selection criteria of the study were examined

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- 37.87% of the lesions detected mammographically were of BIRADS 4b type
- When the mammographically detected suspicious lesions were compared with histopathological examination findings of respective lesions, 96.96% turned out to be malignant and 3.03% were benign.
- 3.03% (2 cases) of the histopathological confirmed benign lesions was found mammographically as BIRADS 4a (low suspicion for malignancy 2-9%).
- In the present study, the inclusion criteria being "the lesion which are suspicious of malignancy" hence the study population includes only those with results of B-RADS IV-V but not the other categories, hence the validity of Mammography couldn't be calculated.

The results of our study, are almost comparable to the studies of

In a study conducted by Dr Lovely Yesmin and et.al.,Mammographicevaluation of breast mass and comparison with histopatholgical findings[11], results were, Mammography malignant was found 14 cases out of which 10 (76.9%) malignant and 4 (9.1%) benign evaluated by histopathology. Compared to this the present study got similar results 96.6% of mammographically detected malignant lesion turned out to be histologically malignant, and 3.03% turned out to be benign. Conclusion of the study was Mammography is highly sensitive, specific, reliable and useful method in the differentiation of malignant and benign breast masses[4].

In a similar study conducted by Dr. Varsha and Dr. Kalyani , Assessment of the breast masses with diagnostic mammography and FNAC correlation[12], they conducted a prospective study of 63 patients of breast lumps. Results were, in 63 patients with lesions, 44 were proved cytopathological benign and 19 were malignant; 3 male patients were also included, out of 63 patients, 12 in BIRADS 4 and 5 in BIRADS 5 categories. Out of 17 malignant cases in BIRADS 4 and 5, 1 was false positive and 16 proved to be true positive. The statistical analysis was done and parameters calculated. On comparison with the present study out of 66, 2 was false positive mammographically and remains 64 were true positive[13]. They concluded that the Diagnostic mammography is highly sensitive and accurate in detection and characterization of breast lumps, especially the malignant and the ACR-BIRADS lexicon proved useful in uniform mammography reporting and consistency in lesion classification[13].

Another study published by Dr Fatemeh Haghighi and et al.,Comparison of Mammography and ultrasonography findings with pathology resin patients with breast cancer in Birjand, Iran[14]. They conducted a descriptive cross-sectional study using medical records of 79 patients with breast malignancies, The results of ultrasonography and mammography were compared with pathology findings as the gold standard. pppp[The results came as, the mean age of the patients was 46.94 ± 11.76 years, when compared the mean age of the patients were 51.02 ±10.562 years. About 72.5%, 24.6%, and 2.9% of the patients had stage 2, 3, and 1 breast cancer, respectively[15].

Conclusions

On studying the mammogram of clinically suspicious breast lesions of study population and comparing it with histopathological results, it can be considered a primary diagnostic tool in the evaluation of breast lesions and as a reliable and useful tool in differentiation of malignant and benign breast masses. However mammogram cannot be considered as an alternative to the gold standard histopathological examination, which is needed not only in confirming the diagnosis but also for choosing the treatment modalities, evaluating the prognosis of the disease.

Conflict of Interest: Nil
Source of support: Nil

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