

Role of Mammography in Diagnosing and Identifying Calcification of the Breast in Women

Yusra Abd Hassan Attia¹, Dr. Mayada Hassan Nashmi² and Dr. Shehrazad Nahi Jebur³

¹Master of Radiology, Radiology Department, Technical Medical Institute of Middle Technical University, Baghdad, Iraq

²M.B.Ch.B., C.A.B.O.G. \ (Obstetrics and Gynecology), Iraqi Ministry of Health, Babil Heath Department, Imam AL-Sadiq Teaching Hospital, Babil, Iraq

³M.B.Ch.B., F.I.C.O.G., D.G.O. \ (Obstetrics and Gynecology), Iraqi Ministry of Health, Diwaniyah Health Directorate, Al-Diwanyia Maternity and Pediatrics Teaching Hospital, Diwaniyah, Iraq

Abstract: Background: Breast diseases are classified as disorders of the skin of the breast or disorders of the reproductive system. The majority of breast diseases are noncancerous. The aim of the study was to discover the presence of diseases affecting the breast in order to treat and reduce them. Materials & Methods: The study included 99 females with various breast diseases at different age stages. These cases were collected from Al-Husseini Hospital and Zine El-Abidine Hospital. This study was conducted in the year 2023. These cases were classified into groups according to age, genetic status, breastfeeding, tumor forms, and symptoms specific to each patient. The study concluded that Breast diseases abound in women who have reached an advanced age, who are late in 9 their marriage, who are late in their pregnancy with their first child, who have not been breastfed, or women who use hormones for treatment during menstruation and exposure to radiation. Result: The study recommended avoiding these causes as much as possible, paying attention to sports and healthy eating, and the need for periodic examinations, and for mothers to adhere to breastfeeding. At the interviews, the percentage of the confidence coefficient was 44.1 % of the sample, and his library was 44.1 % of the sample, 98 individuals. There are relationships between some variables. Conclusion: In this study found in the diagnosis, calcifications are more common in women, and breast calcifications can be an early sign of cancer. In our study, it was found that there is a relationship between age and calcification.

Keywords: Breast calcifications, tumor, radiation, majority, mammogram.

INTRODUCTION

Breast calcifications are frequently identified on mammography, with their prevalence rising with increasing patient age. While the majority of microcalcifications arise from benign pathologies, certain clustered patterns may indicate malignant pathology or high-risk lesions. It is crucial to distinguish microcalcifications of benign origin from suspicious ones, as the presence of microcalcifications accounts for 55 % of non-palpable cancer diagnoses [Castellaro, A. M. *et al.*, 2015; Cox, R. F. *et al.*, 2013].

Benign calcifications are usually larger, have a characteristic appearance, and do not require magnification. The suspects, on the other hand, are usually smaller and should be studied with magnified plates for their characterization [Morgan, M. P. *et al.*, 2005].

That mammography is generally accurate in detecting breast calcifications, but its accuracy depends on the size and clustering of the calcifications, and sonography is not effective in detecting calcifications smaller than 2mm, which limits its use as a screening tool for cancer detection [Scimeca, M. *et al.*, 2014].

As previous studies investigated the automatic detection of clustered calcifications in digital mammograms and found that the computer system

achieved a 25/25 true positive film classification with false positive clusters detected in 4/50 films [Choi, S. *et al.*, 2015].

As Wee 1975 improved a computer pattern recognition program to assessment calcifications seen on mammograms and found that 81.2 % of the lesions studied were correctly identified as malignant or benign. And discussed the importance of careful analysis of mammograms in a search for features indicating benignity to decrease the number of biopsies for benign conditions.

That mammography has varying accuracy in detecting calcifications in the breast in different clinical settings and that contrast-enhanced spectral mammography (CESM) only slightly improves the diagnostic accuracy of the evaluation of breast calcifications compared to full-field digital mammography (FFDM) [Weerakkody, Y. *et al.*, 2016].

Positron emission mammography (PEM) had a high sensitivity and specificity for identifying malignant lesions in patients with suspicious calcifications detected on mammography.

Breast MRI utilizes magnets and radio waves to capture images of the breasts. It's used alongside

mammography to help screen women at high risk for breast cancer. Breast MRI is not recommended for women at average risk because it can produce an abnormal result even without cancer [Dance, D. R. et al., 2011; van Engen, R. E. et al., 2016].

And this study aims to determine the Determination of calcification and its relationship to chronic and non-chronic diseases and identify the disease and its relationship to age, marital status, and Breastfeeding.

PATIENT AND METHOD

A cross-sectional descriptive study was conducted at Zain Al-Abidin and Al-Hussein Hospital from October 2022 to December 2023. The study population consisted of all female patients referred to the radiology department for mammograms. The mammograms were carried out using a Siemens machine at Al-Hussein Medical Hospital, a public/government facility with mammogram services. It receives patients referred from all referring hospitals, as well as patients from several hospitals in Baghdad and its surrounding areas.

Included a group of 99 female patients with breast symptoms such as palpable lumps, pain in the breast, nipple discharge, localized lumpiness or nodularity, Nipple retraction, redness, and swelling of the breast were examined independently through mammography; images were obtained and assessed carefully. Mammograms were interpreted According to the breast imaging reporting and data system.

Diagnostic categories on a five-point scale. The diagnosis was scored on a five-point scale identical to the mammographic BI-RADs categories. A total of 99 breast lesions were examined by histological methodology. Histopathology results proved the presence of breast cancer and classification in the cases, and results were correlated according to the histopathology findings.

ETHICAL APPROVAL

For conducting the study was obtained from the Medical Ethical Committee and College of Analytics, University of Karbala.

Permission to conduct the study at Zine El Abidine Hospital and Al Hussein Teaching Hospital. Only the information recorded in the questionnaire was used, and nothing else.

Sampling and Sample Size

All approved patients with breast disease who were referred to a mammogram machine were included in the study. Total radiologists were studied in the year 2023 who met the study criteria and Include exclusion criteria.

We excluded women under the age of 30 because it is preferable for them to have an ultrasound examination for this age group, and We also excluded pregnant women because of the effect of radiation on pregnancy.

RESULTS

Table 1: Patient distribution by age (n=99)

Age	Number	Percentage %
≤24	1	1.0
30-39	8	8.1
40-49	49	49.5
50-59	33	33.3
60-69	7	7.1
70≤	1	1.0
Total	99	100.0 %

Table 2: Distribution of gender and surgery

Table 2.SURGERY * gender			
Variable	gender		Total
	NO	female	
SURGERY	NO	97	97
	YES	2	2
Total		99	99

Table 3: distribution of patients according to the pain and the side

		BOTH	LEFT	NO	RIGHT	
PAIN	NO	0	0	14	0	14
	YES	16	51	0	18	85
Total		16	51	14	18	99

Table 4: Distribution of patients based on the examination (n=99)

		Examination	Number	Percentage %
v	NO		39	39.4
	YES		60	60.6

Table 5: Distribution of patients based on the cycle (n=99)

Cycle	Number	Percentage %
IRREGULA	20	20.2
MISMENST	35	35.4
REGULAR	44	44.4
Total	99	100.0

Table 6: Outcomes of patient’s basis of cycle

BREAST FEEDING * OCCUBATON					
		OCCUBATON			Total
		EMPLOYE E	HOUSEWIF	TEACHE R	
BREAST FEEDING		0	2	0	2
	NO	1	27	5	33
	YES	2	55	7	64
Total		3	84	12	99

Bar Chart

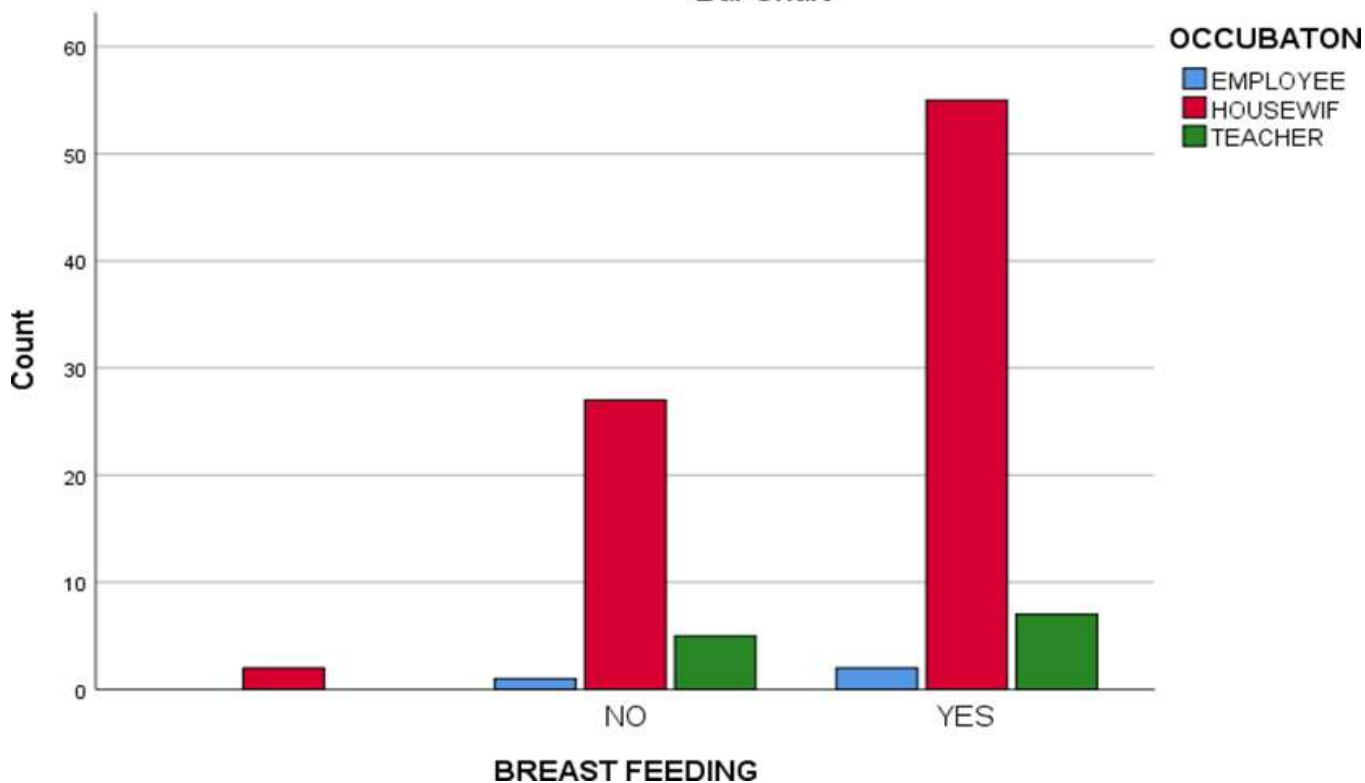


Figure 1: Breast finding *occupation

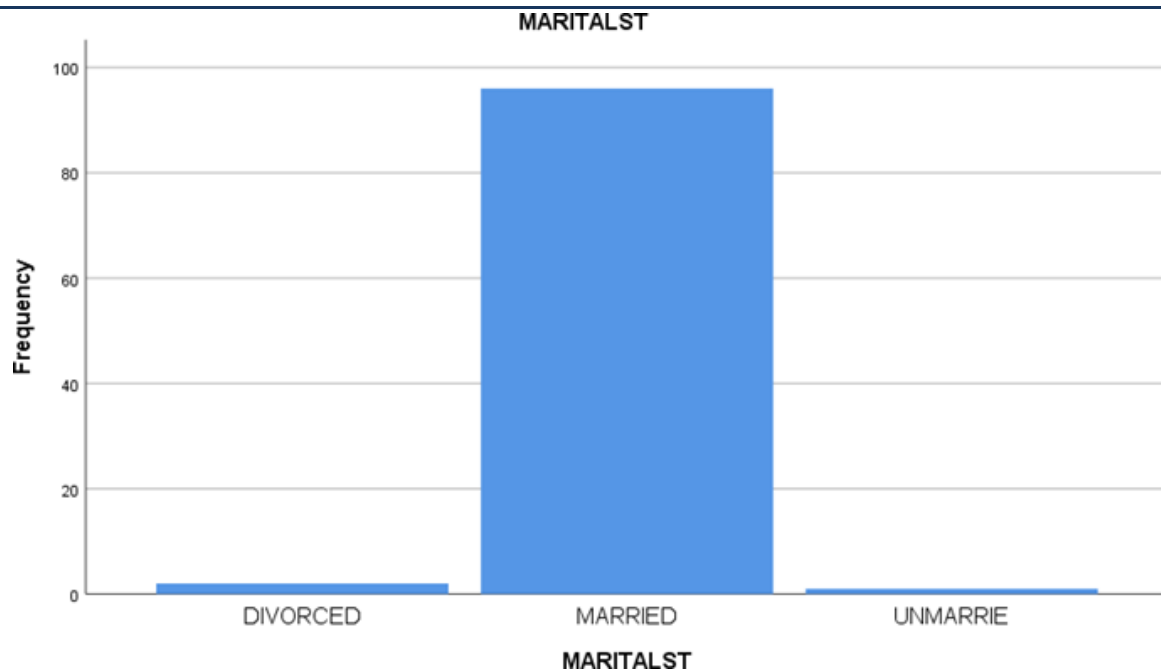


Figure 2: Distribution of patients based on marital status

DISCUSSION

Breast calcifications are deposits of calcium within breast tissue, visible as white spots on mammograms.

Such calcifications are often seen on mammograms, and this study's examination of 99 patients by mammography showed that they had breast calcification lesions. This finding is consistent with previous research showing that this condition can affect men, although at a lower percentage than women Velazquez Berumen, A. *et al.*, 2018].

It was found that there is a relationship between age and calcification of breast lesions diagnosed in the mammogram, and this is consistent with previous research and studies that proved this and mentioned the following. [Birdwell, R. L. *et al.*, 2009]

In our study, it was found that breast calcifications lesion can occur as a result of previous surgeries, and this is consistent with previous studies and research that have proven this and indicated the following Malignant, or cancerous, breast calcifications can be caused by: Prior breast cancer treatments, such as breast cancer surgery or radiation therapy for breast cancer. [Elter, M. *et al.*, 2009]

They were observed there is a relationship between pain and the side of calcification in the breast. P value <0.05, through the study, it was found that calcification can occur on the right or left side or

on both sides. This is consistent with previous studies that proved this. Benign calcifications are often scattered throughout both breasts. If one breast has calcifications and the other doesn't, that could be a sign that we need to take a closer look at them. We noticed in our study that this calcification causes pain to the patient, and this did not correspond to scientific research and previous medical studies that proved the exact opposite and mentioned the following (Venkatesan, A. *et al.*, 2009).

I found that there is a relationship between breast calcification and smoking, p-value <0.05, and this is consistent with previous studies and research that proved this. [Rominger, M. *et al.*, 2012]

For breast calcification patients in Karbala Governorate, it was found that some of the diseases have a family history of this disease, and this is consistent with previous research and studies that proved this and mentioned the following. Mammographic calcifications were associated with both. A family history of breast cancer was not routinely collected. [Terry, P. D. *et al.*, 2002]

In this study, there was no correlation between calcified lesions in the breast and blood pressure, which is contrary to previous research suggesting the contrary. Vascular calcification is thought to be a highly controlled process that is promoted by smooth muscle cells within the vasculature. Hypertension is known to accelerate vascular

calcification, which can, in turn, exacerbate hypertension. [Jiang, X. *et al.*, 2014]

It was found that there is no relationship between breast calcifications and the menstrual cycle, p -value >0.05 and this is consistent with previous studies and research that proved this. The study reported changes in the breast-associated

With the menstrual cycle. Breast calcifications were not mentioned. The study explained the following. During menstruation, many women also have changes in breast texture. Their breasts may feel very lumpy. This is because the glands in the breast are enlarging to get ready for a possible pregnancy. [Llovet, J. M. *et al.*, 2016]

It was found that breast calcifications do not cause any findings or symptoms, p -value >0.05 . and this is consistent with scientific research and previous studies that proved this and mentioned the following. Breast calcifications do not cause symptoms, as they are too small to be felt during a routine breast exam. Usually, breast calcifications are first noticed on a mammogram. [Tobias, D. K. *et al.*, 2017]

There is no relationship between examination, occupation, marital status, and breast calcification p value >0.05 . [Neuhouser, M. L. *et al.*, 2015]

The accuracy of mammography in detecting calcifications in the breast varies depending on the size of the calcifications and the imaging techniques used. Previous study found that sonography was ineffective in detecting calcifications smaller than 2 mm. This severely limits its usefulness as a screening tool for cancer. However, Davies (1990) reported that an automated computer system achieved perfect 25/25 true positives for clustered calcifications on digital mammograms with zero false negatives.

Also, in other studies reported that a computer pattern recognition program could aid the assessment of breast calcifications with an accuracy of 84.3 %. Lw 1992 observed that although mammography is highly sensitive in detecting calcifications, it lacks specificity, which leads to a significant number of false-positive mammograms and a relatively low true-positive biopsy rate. The paper also recommends that mammograms should be carefully analysed to detect benign features to reduce biopsy for benign diseases.

CONCLUSION

It can be concluded that classification breast

calcifications they're especially prevalent after age 50; a higher percentage of classification patients were in (the 40-49) age group. That breast calcification lesions can occur as a result of previous surgeries, and there is a relationship between pain and the side of calcification in the breast. Calcification can occur on the right or left side or on both sides. There is a relationship between diabetics and breast It was found that there is a relationship between breast calcification and smoking; smoking is a well-known risk factor for breast cancer conducted for breast calcification patients in Karbala Governorate, it was found that some of the diseases have a family history of this disease.

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