Original Article

Clinical and Mammographic Findings of Patients Referred for Mammography in Babcock University Teaching Hospital: A Retrospective Study of the First Year Post-installation Patients.

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ABSTRACT

Background: Breast diseases are world-wide and include a spectrum of conditions ranging from inflammatory lesions to benign and malignant neoplasms. Mammography is one of the imaging modalities of choice in the modern management of these patients. However, this investigation is expensive but has a good diagnostic yield in patients referred for breast imaging services. This study was conducted at Babcock University Teaching Hospital (BUTH), Ilisan Remo, which serves the people of Ogun state and the neighbouring states. As at the time of this study, it was the only public hospital with a mammography machine in South West (SW) Nigeria. Objectives: The objective of the study was to describe the demographic characteristics, clinical presentation, mammographic findings and pattern of breast diseases in the first year after installation, and to compare the results with previous studies, with a view to improving its application in our setting. Methodology: This one year retrospective study was carried out on 132 patients seen at the Radiology department of BUTH, which, was then the only referral centre for patients within SW Nigeria. Radiology request cards, documented radiology reports, and soft copies of mammographic images were collected by our residents who served as research assistants. The radiologists reviewed the mammograms and reports. Patients with incomplete medical information were excluded from the study. Statistical Package for Social Sciences (version 26 software) was used for data analysis. Results: The age range was between 36 and 90 years, with the highest frequency between 46-50 years age group (19.7%), while the lowest frequency was found among women that were 70 years and above. Twenty seven point nine percent (27.9%) of the women came for routine mammographic screening, followed by those with breast pain and masses. Only 18.2% had normal mammograms, while BIRADS 2 lesions had the highest occurrence with a total of 38.10%. No male patient presented during the review period. Conclusion: Mammography requests in the study environment are mainly for diagnostic purposes, but screening mammography is gradually becoming significant. Public awareness, poverty reduction and ready availability of mammography facilities are required to improve mammography screening. Also, breast masses and micro-calcifications are the commonest types of pathology found in mammography.

INTRODUCTION

Breast masses are common clinical and radiological findings which are usually encountered worldwide, but effective evaluation and prompt diagnosis with modern imaging modalities will frequently rule out malignancy.[1] Imaging has an important role to play in the management of breast diseases, which, often present as masses, pain, mastitis, and the likes.[2] Breast imaging has only come of age in the twenty-first century, beginning with the introduction of mammography.[3]

In many developing countries like Nigeria, a combination of mammography and breast ultrasound have become key modalities for imaging the breast.[4,5] However, mammography is highly sensitive for early detection of neoplasm and thus remains the goal standard in breast cancer screening.[3-5] But recent increased awareness of breast cancer and establishment of breast imaging units has led to high turnout of patients. However, the cost of the investigation is still a limitation.[6] Mammography screening to detect early breast cancer is a part of the normal, nationwide health program in many developed countries, but it is, however, not yet a policy in Nigeria and many other developing countries.[7-10] Mammography is a newer imaging modality in our centre and serves Ogun state and its neighbours, since many secondary and tertiary institutions do not have functional machines. We, therefore, aim to audit the mammography requests in our facility with a view to improving its application in our setting.

MATERIALS AND METHODS

Prior ethical clearance was obtained from the institution's research and ethical committee. As of the period in question, BUTH had one of the few mammographic machines within the country, with many other patients being referred from other tertiary health institutions within the country while many came on their own.

This one-year retrospective study was conducted on 132 patients in the Mammography unit of the Radiology Department, BUTH from February 2022 to January 2023, where a General Electric (GE) Senographe Pristina (Artemis, 2021 MODEL) machine was used. Inclusion criteria were women who had complete data while those with incomplete data were excluded. The mammography protocol was used, and two standard views [cranio-caudal (CC) and mediolateral oblique (MLO)] were acquired, with additional views where necessary.

A proforma was used to document the obtained information about the patients. The imaging findings were documented in the proforma. A retrospective analysis of their request forms, duplicate copy of radiology reports, and soft copy of mammography images of the patients were reviewed and interpreted independently by two consultant radiologists whose practice is not less than 15 years post-qualification. All data was entered, tabulated, categorized using the BIRADS' classification and analysed, using the Statistical Package for Social Sciences (SPSS 26, Armonk, NY: IBM Corp). Frequency distributions (proportions), graphs, charts and tables were drawn to present the data appropriately.

RESULTS

A total of 132 women who met the inclusion criteria participated in this retrospective study over a period of 12 months, with an age range of 36 and 90 years. There was no male patient that presented with a breast mass during the study period. The highest frequency was seen within the 46-50 years age group (19.7%), followed closely by 51-55 (18.9%), and 56-60 years age groups (16.7%) respectively (table 1). The least frequencies were found among women between 71 and 90 years of age. The highest number of patients came for routine mammography, making 27.9% of indications. These patients walked into our unit because they were interested in what they called 'self checkup'. This was followed by those with breast pains (21.8%) and masses (17.7%) respectively (table 2). Watery nipple discharge, breast swelling and axillary masses constituted 10.8%, 5.4% and 4.1% respectively. The least presentations were bloody nipple discharges, breast skin thickening and weight loss.

The percentage of bilateral normal breasts is 12% while left and right breasts are normal by 3.64% and 2.54% respectively (table 3). Bilateral breast masses account for 4% while left and right breast masses constituted 9.45% and 9.09% respectively. Others include ductal ectasia, fat necrosis, focal mastitis and retracted nipple.

BIRADS 2 lesion had the highest occurrence with a total of 38.10%, having 12 incidences bilaterally and 10 each for the right and left breasts respectively, while BIRADS 6 had the least frequency of occurrence of 1.19% (table 4). Summarily, 48.8% of the BIRADS cases were bilateral while the left breast was more affected when compared to the right (23.8% and 27.4%

Table 1: Age range of the patients

Age range	No. of patients	Percentage (%)
36 - 40	10	7.6
41 - 45	21	15.9
46 - 50	26	19.7
51 - 55	25	18.9
56 - 60	22	16.7
61 - 65	16	12.1
66 - 70	3	2.3
71 - 75	2	1.5
76 - 80	2	1.5
81 - 85	2	1.5
86 - 90	3	2.3
Total	**132**	**100**

Table 2: Clinical indication distribution on pattern

Presenting complaints	No. Of patients (freq)	Percentage (%)
Routine screening	41	27.9
breast pain	32	21.8
breast mass	26	17.7
Watery Nipple discharge	16	10.8
Breast swelling	8	5.4
Axillary mass	6	4.1
Previous lumpectomy	6	4.1
Breast cancer	6	4.1
History of mastectomy of	3	2.0
Bloody nipple discharge	1	0.7
Skin thickening	1	0.7
Weight loss	1	0.7
Total	**147**	**100**

Table 3. Distribution of mammographic image findings.

Image findings	No. Of patients (Frequency)	Percentage (%)
Bilateral normal breast	33	12.00
Normal left breast	10	3.64
Normal right breast	7	2.54
Bilat breast masses	11	4.00
Left b reast masses	26	9.45
Right breast masses	25	9.09
Bilat calcification	7	2.54
Right calcification	8	2.91
Left calcification	6	2.18
Axillary/mammary adenopathy	51	18.54
Right BIRADS 6	1	0.36
Bilat BIRADS 5	1	0.36
Right BIRADS 5	4	1.45
Bilat BIRAD S 4	10	3.64
Right BIRADS 4	5	1.82
Left BIRADS 4	5	1.82
Bil BIRADS 3	2	0.73
Left BIRADS 3	8	2.90
Bilat BIRADS 2	12	4.36
Right BIRADS 2	10	3.64
Left BIRADS 2	10	3.64
Bilat BIRADS 1	16	5.82
Others	7	2.54
Total	**275**	**100**

Table 4. BIRAD classification by breast's side

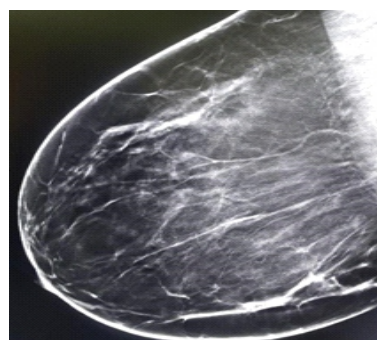|	Bilateral breasts	Right breast only	Left breast only	Total	Percentage (%)
BIRADS 6	-	1	-	1	1.19
BIRADS 5	1	4	-	5	5.95
BIRADS 4	10	5	5	20	23.81
BIRADS 3	2	-	8	10	11.90
BIRADS 2	12	10	10	32	38.10
BIRADS 1	16	-	-	16	19.05
Total	**41**	**20**	**23**	**84**	**100**

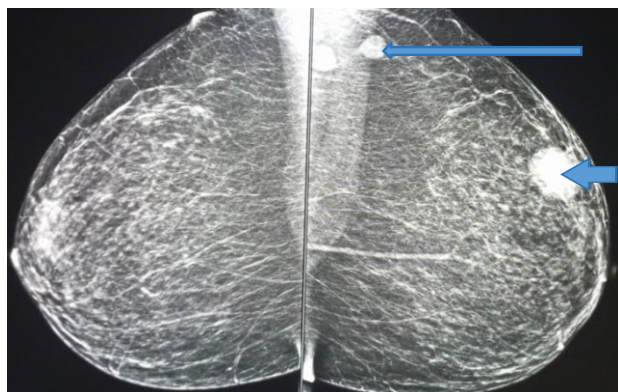Fig.1. A mammogram of the right breast showing the normal anatomy.

Fig. 2. Mediolateral oblique (MLO) views show a solitary mammary mass (short thick arrow) with smooth borders in the left breast. There are also intramammary lymph nodes (long arrow) within the ipsilateral breast towards the tail.
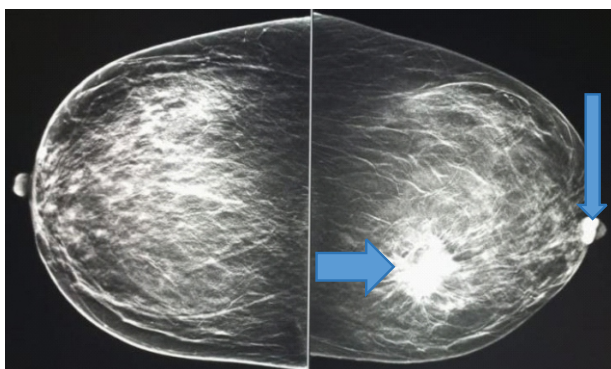

Fig. 3. Craniocaudal views showing a solitary mammary mass with irregular borders in medial aspect of the left breast (short thick arrow). There is also a calcified mass at the areola-nipple margin (long thin arrow).
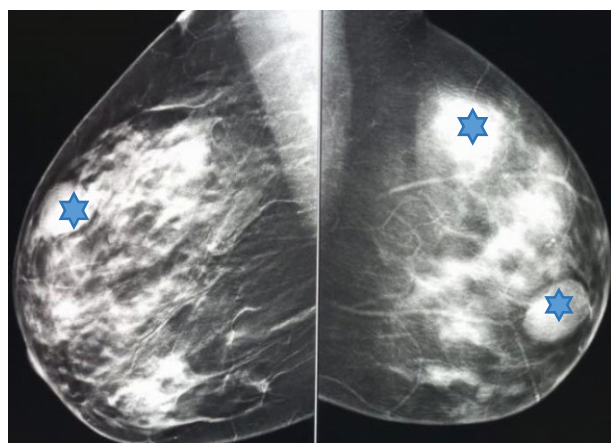

Fig. 4 Mediolateral obligue (MLO) view showing multiple masses of different sizes and densities in both breasts (bilateral arrows).

DISCUSSION

A total of 132 women participated in this retrospective study, with an age range between 36 and 90 years (table 1), which is not very much different from the range by Akande et al in Ilorin, Nigeria and Guena et al in Duala, Cameroun.[4,5] No male patient was seen during the period under review. However, compared to Guena et al, few males were seen in their study.[4] The highest frequency of attendance was seen in patients within the 46-50 years age group which constituted 19.7% of the patients. This tallies with the findings of Akande et al in Ilorin, Eni et al in Abakaliki,[2, 4] and Guena et al in Duala who had the highest percentage of 58%.[11]

Those who voluntarily came of their own volition for routine mammography constituted the highest frequency, making 28% of all patients (table 2). This value is slightly lower than that of Guena et al where 33% came for routine screening in Duala.[4] However, Akinola et al, in Lagos, had 41.7% of people who voluntarily came into the hospital for routine screening.[10] This highest percentage was, most probably, from the high level of awareness among Lagos' residents when compared to other areas within west Africa. In Nigeria and many other African nations, there are no organized general breast screening programs except for the few women who personally initiate their breast screening.[4, 10, 12] This group was followed by those with breast pains (21.9%) and masses (18.1%) respectively (table 2). Comparatively, the values by Guena et al were 27% for breast pains and 25% for breast masses.[4] In the case of Akinola et al, 23% presented with lumps while 18% with pains.[10]

Within this study period, the percentage of normal mammographic breast findings was 18.2% (table 3 and fig. 1). This tallies with the findings of Kiguli-Malwadde et al and Akande et al.[5,12] However, Guena et al reported a high percentage of 58.1% patients who had normal breast findings.[4] This was followed by breast masses which accounted for 22.54% of all mammographic findings (figs. 2-4). This is similar to the 22.6% result of Guena et all, but was the third finding by Obajimi et al.[4,13] In this study, BIRADS 2 lesions had the highest occurrence with a total of 38.10%. This finding is similar

to that of Akande et al, Pak et al and Akinola et al,[9, 10, 13] but at variance with Obajimi et al whose study showed BIRADS 1 as the the most frequent occurrence.[14] Forty-eight point eight percent (48.8%) of the BIRADS cases were bilateral while the left breast was more affected when compared to the right (23.8% and 27.4% respectively). This agrees with the finding of Abdou et al[15] but at variance with the finding of Muhammad et al who reported that breast masses were slightly commoner on the right side than the left.[16]

Though mammography is expensive and not readily accessible to the ordinary people in developing countries, it still remains a gold standard[4,5,7,12] It is used to establish the diagnosis of palpable and non-palpable breast lesions.[10, 17] However, its sensitivity in cancer detection is reduced in mammographically dense breasts.[2, 18] When ultrasound is added to mammography, there is increased sensitivity from 50% with mammography alone to nearly 78% when there is a combined use of mammography and ultrasound.[1,19] This later modality is mostly used to complement the evaluation of suspicious lesions detected on mammography and/or after clinical examination.[4]

In the absence of routine mammography screening services, breast ultrasound can be an effective way of evaluating palpable breast masses.[2, 5, 20] Also, when mammography is combined with magnetic resonance imaging (MRI), the sensitivity goes above 80%.[21] Despite the supplementary modalities, mammography has advantages over ultrasonography and magnetic resonance imaging techniques due to its reported high sensitivity and specificity, non-operator dependence, relative availability, and affordability.[22, 23] However, some of the drawbacks of mammography are high costs for the tests, poverty, ignorance, non-availability of the screening modality and fear of irradiation expressed by the patients.[20] Other drawbacks which reduce acceptance are fear of the unknown following an affirmative diagnosis and beliefs in alternative medicine.[24]

Health policies should be formulated by government to ensure that mammography becomes readily available, with creation of public awareness. These will reduce morbidity and mortality from breast masses and cancer.[25] Since mammography machines are very few in our environment, clinical breast examination (CBE) and breast self-examination (BSE) should be encouraged as a method for investigating and early detection of breast cancer in the developing world.[26, 27] This method of combining mammography with ultrasonography, clinical breast examination and breast self-examination is commonly practiced in Nigeria and Cameroon.[2,4,26]

CONCLUSIONS

Mammography requests in the study environment are mainly for diagnostic purposes. Screening mammography is becoming significant but is yet to be fully utilized. Public awareness, poverty reduction and ready availability of mammography facilities are required to improve screening mammography in our setting. Also, breast masses and micro-calcifications are the commonest types of pathology found in mammography.

Implications of the findings of this study

The implication of this study is that mammography has immensely changed the pathways of breast disease management. This imaging modality, in addition to other modalities have improved the diagnostic and survival rate of breast neoplasms. It is essential to emphasize that there are few disadvantages of mammography, which include limited availability and high cost for a breast scan session.

Limitations of the Study

1. This was a single center study with small sample size.

2. The BI-RADS score may not be reliable for younger women.

3. The pathological anatomy was not performed to determine the true rate of cancer and benign lesions during period

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