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BI-RADS 3 category breast lesions: mammography follow- up in Gabonese women
Lésions mammaires de catégorie BI-RADS 3 : suivi mammographique chez les femmes Gabonaises

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Résumé

Contexte et objectifs. Le cancer du sein est souvent diagnostiqué à un stade avancé chez les femmes africaines. Les performances diagnostiques des radiologues ont montré des lacunes dans l'interprétation de lésions, en particulier la lésion selon le système Breast Imaging Reporting and Data System BIRADS-3. La présente étude a évalué le suivi et apprécié l'évolution de ces lésions chez les femmes au Gabon. ***Méthodes***. Par une approche documentaire, des données mammographiques collectées entre 2012 et 2016 ont été revues séparément par 2 radiologues de différents services de radiologie à Libreville/Gabon. Seules les lésions mammaires classées BI-RADS3 ont été évaluées (le suivi des lésions et leur évolution dans le temps par la mammographie). ***Résultats***. Sur les 1033 mammographies analysées, un total de 226 (21,9 %) lésions classées BI-RADS 3 (210 femmes) a été retenu. Le suivi par mammographie n'a pu être évalué que sur 20,5% femmes. Quatre-vingts un pour cent ont fait le premier contrôle, 14 % ont réalisé 2 contrôles et seulement 5% ont réalisé le troisième contrôle recommandé. L'évolution de ces lésions BI-RADS 3 était caractérisée le plus souvent par une régression des lésions (67 %). ***Conclusion***. Bien qu'une régression lésionnelle soit observée dans le temps, seulement une femme sur cinq ayant des lésions du sein classées BI-RADS 3 réalise une mamographie de contrôle. Ce qui rend hasardeuse l'évaluation et la prise en charge de cette lésion au Gabon.

Mots-clés: BI-RADS 3, sein, suivi mamographique, Gabon

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Summary

Context and objectives. Breast cancer is often diagnosed at an advanced stage in African women. The diagnostic performance of radiologists has shown shortcomings in the interpretation of lesions, particularly the lesions according to the Breast Imaging Reporting and Data System BI-RADS 3. The present study aimed to evaluate the mammographic follow –up and assess the evolution of these BI-RADS 3 lesions in women in Gabon. ***Methods***. In this retrospective study, data of mammograms recordered between 2012 and 2016 were reviewed separately by two radiologists from different radiology departments in Libreville (Gabon). Only BI-RADS 3 breast lesions were evaluated (as the follow-up of the lesions and their evolution over time by mammography). ***Results***. Of the 1033 mammograms analyzed, a total of 226 (21, 9 %) BI-RADS 3 lesions (210 women) were included. Mammographic follow-up could only be assessed in 20% of women. Eighty-one percent performed the first follow-up examination, 14% performed 2 follow-up and only 5% performed the third recommended mammographic follow-up. The course of these BI-RADS 3 lesions evolutions was most often characterised by regression of the lesions (67%). ***Conclusion***. Although lesion regression is observed overtime, only one in five women with BI-RADS 3 breast lesion performs a control mammogram. This makes challenging the assessment and management of this lesion in Gabon.

Keywords: BI-RADS 3, Breast, follow-up mammography, Gabon

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Introduction

Currently, breast cancer is the most common cancer in African women (1) and its incidence is increasing consistently in African countries (2). Unfortunately, breast cancer is often diagnosed at late disease stages in sub-Saharan Africa, which may be responsible for the high mortality rates observed (1, 3-6).

Developing a systematic approach for early detection and diagnosis of breast malignant lesions may help to reduce the risk of death from breast cancer in less developed countries and mammography is recognized as an effective tool to achieve this goal (7). In several Western countries, mammography screening, through organised programs is recommended for infra clinic breast lesion detection (8-11). The Breast Imaging Reporting and Data System (BI-RADS) classification system enables to communicate the results in a clear and standardized manner (12). BI-RADS classification was adopted in Gabon in 2006 (13). Diagnostic performance of radiologists using the BI-RADS classification has shown shortcomings in the evaluation and interpretation of some lesions, particularly the BI-RADS 3 category lesion (13-14). BI-RADS 3 breast lesions are detected often in mammography screening programs (15-17) and are designated as « a probably benign lesion » in mammography but can progress to malignant lesion. Recommended management was to follow-up these breast lesions for 2 years with repeat examinations at 6 and 12 months allowing to reduce the number of surgical biopsy (12,15,18). If the lesion appears stable, the recommended follow-up interval is extended to 1 year (12,15). Because BI-RADS 3 lesion is the one which poses the most of problem of interpretation and in which management strategy is sometimes discussed, we have focused on this BI-RADS category lesion. In addition, there have been no reports in Gabon on BI-RADS 3 category lesions. So, the purposes of the present study were the following: (1) to estimate the prevalence of BI-RADS 3 lesions, (2) to assess the rate of patients who received appropriate follow-up mammography and determine the main causes of non-compliance with follow-up and (3) to appreciate the mammographic lesions evolution in order to improve the management of these patients.

Methods

Design, setting and period of study

We conducted a retrospective and descriptive study including data of mammography recorded between January 2012 and January 2016 at the Institut de Cancérologie de Libreville (ICL) and at the Centre Hospitalier Universitaire d'Angondje (CHU A). A standardized questionnaire was established, and information was collected from medical records. For missing information, questionnaire was completed if necessary, during the patient's clinical examination at ICL. The data of patients were collected and registered confidentially with respect of the rules of confidentiality and anonymity.

Data collection

Data included demographics information (e.g age), clinical data (e.g reason of consultation, breast symptom), mammographic data (e.g breast density, mammographic lesions). The quality of follow-up mammography and the evolution of these BI-RADS 3 lesions by mammography were also noted. Then, the women who had not carried out their mammographic surveillance properly were contacted by phone in order to understand the reasons.

A total of 1033 mammograms in 1006 patients were performed.

Only women with BI-RADS 3 category breast lesion without history of breast cancer and who provided verbal inform consent were included in this study.

Two hundred and ten women were categorized as BI-RADS 3 lesion. The age of these women range from 24 to 71 years old (mean age 48 years).

Among these 210 women, 167 were excluded (153 were lost to follow-up and 14 underwent biopsy and subsequently lost to follow-up). Finally, mammography follow-up could only be studied in 43 women.

Clinical data

Mammography was performed in 724 (72%) women because they had clinical symptoms and therefore for only 282 (28%) patients, it was a routine mammography screening. We looked for breast symptom, family history of breast

cancer, body mass index and clinical examination.

Mammography imaging data

Digital mammography was performed in 2 different radiology departments in Libreville (capital of Gabon). The images were acquired using the DRYVIEW 6850 Lazer Imaging System (Carestream) or the Fuji Medical Dry Laser Imager DRYPIX Plus. The mammographic image as well as supplemented ultrasound in case of breast density type 3 and 4 were analyzed by 2 radiologists according to Breast Imaging Reporting and Data System (BI-RADS) (from) of the American College of Radiology (ACR).

The radiology service of CHU A having PACS (Picture And Communication System) software, we collected mammography data from informatized registries. Concerning the other radiology service, the information from the mammogram was found in the patients' medical file.

These 2 radiologists (with 10 and 13 years of experience in radiology) are not breast radiologists and have read mammographic images in single reader separately. In this study, we just consider the report from these 2 readers without re-interpretation of mammographic films.

We recorded breast density, findings of mammography (e.g calcifications, opacities). BI-RADS 3 is defined according to ACR as "probably benign lesions, including uncalcified lump with negative palpation and clear boundary and focal, asymmetric, clustering, round or dot-like calcifications", and a follow-up in a short time frame is suggested (15).

The mammographic images of the different BI-RADS lesions are illustrated in figure 1.

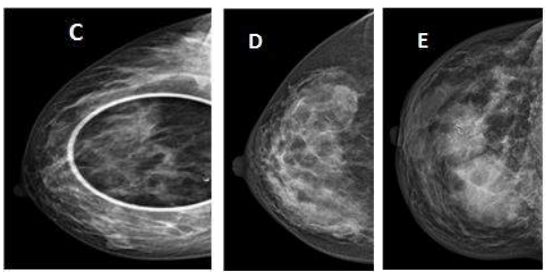

Figure 1. Examples of mammograms from the 5 BI-RADS categories

A. BI-RADS I B. BI-RADS II (round large calcification without opacity) C. BI-RADS III (grouped punctuate calcifications) D. BI-RADS IV (fine, pleomorphic and irregular calcifications) E. BI-RADS V (fine calcifications associated with indistinct contour opacity).

Follow-up mammography

For each patient, the number and date of each mammography were recorded. When the mammographic follow-up was carried out, we evaluated if the period was respected and investigated whether the patient had been informed on procedure of mammography follow-up and the reasons of non-compliance of follow-up recommendations.

We also noted the evolution of the BI-RADS breast lesion (regression, stability or progression).

Statistical analysis

Data have been entered on Excel 2007 and analyzed using R software (version 3.1.0) to perform descriptive statistics. Qualitative data are summarized as proportions and quantitative data as median and extremes.

Results

In the period studied, 1033 mammograms were performed between 2012 and 2016 including 231 (22.4 %) BI-RADS 1, 136 (13.2 %) BI-RADS 2, 226 (21.9%) BI-RADS 3, 274 (26.5%) BI-RADS 4, 64 (6.2%) BI-RADS 5. Fifty-three mammograms were classified BI-RADS 0 and for 49, the information could not be retrieved. Therefore, a total of 226 (21.9 %) lesions in 210 women were classified as BI-RADS 3 lesion.

One hundred fifty-three (72.9 %) of these 210 women had no follow-up and therefore 57 patients (70 lesions) could be included in the study.

Patients and clinical characteristics

The average age of the patient was 48 (24 – 71) years and the most represented age group was 40-59 years old.

Most of these 57 women consulted for clinical symptoms: 24 (42 %) had palpable lumps and 22 (38.5%) had mastodynia. Twenty-eight percent of these women had a mammography routine screening.

None of these women had a history of cancer and we found a family history of breast cancer in 8 (14%) of patients. 24 (42%) women were healthy. Clinical examination was normal in most cases (74%).

Mammographic lesions

Most patients had fatty breasts with 12 (21%) women with a BI-RADS density category 2 and 8 (14%) with a BI-RADS density category 1. The most common imaging abnormalities were microcalcifications (74%), opacities (42%) and focal asymmetry without calcification (15%).

Follow-up mammography and BI-RADS 3 lesion evolution

Among these 57 patients, 14 (24.6%) underwent biopsy because of anxiety or at the recommendation of their physician. Histological results showed that 8 were malignant._These women were lost to follow-up after biopsy leading the number of patients followed by mammography to 43.

Among these 43 women, 38 (88%) performed the first follow-up examination within 6 to 24 months (average of 21 months) and only one of them had respected the recommended timing.

Six (14%) women performed 2 follow-up mammograms. None of them had respected the recommended timing (first follow-up mammography was performed within 9 to 14 months and the second within 15 to 24 months).

Only 2 (5%) women performed the third recommended follow-up mammography: the first mammography was realized within the recommended 6 months period for one of the patients, the second and third mammography were performed for each patient 2 and 3 years later.

Because of the high proportion of women who did not comply with the mammographic BI-RADS 3 protocol, we investigated the reasons for this. We found that 19 (44%) of these 43 women stated that they had not received any information about the procedure from their physician. Of the 18 women who received the correct follow-up information but did not follow it, 44% of them admitted that this non – compliance was due to negligence. The value of 22% explained that they did not understand the recommendations, 11% that the cause was related to a financial problem, 11% others explained a long travelling distances or for one 6% a too long waiting time to obtain an appointment in radiology. No specific reason was given for 6% of patients.

On the 70 BI-RADS 3 lesions (43 patients) who underwent a follow-up mammography, 40 (67%) showed regression, 18 (30%) remained stable and 2 (3%) showed progression and were classified as BI-RADS 4 lesions. Evolution for 10 BI-RADS 3 lesions was unknown.

These results of mammography follow-up are depicted in figure 2 and figure 3.

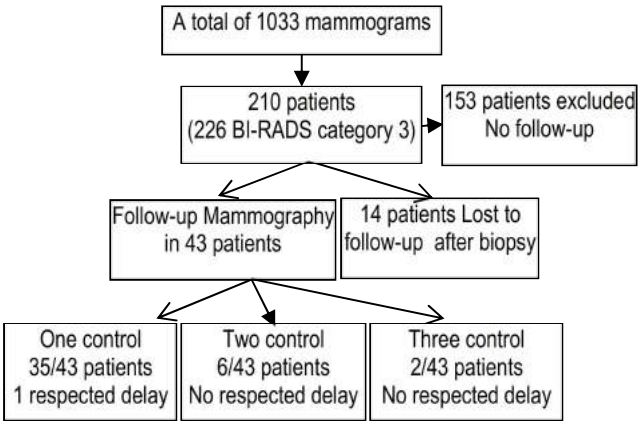

Figure 2. Summary of patients follow-up

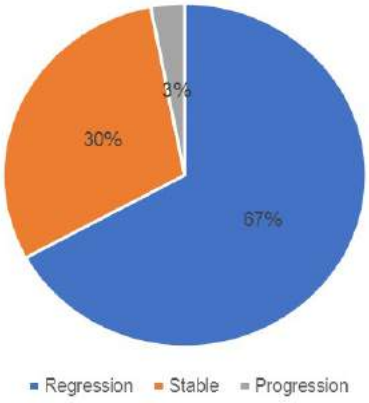

Figure 3. BI-RADS 3 lesions evolution

Discussion

According to BI-RADS classification, BI-RADS 0 was recorded in 53 (5.1%) mammograms, BI-RADS 1 in 231 (22.4%), BI-RADS 2 in 136 (13.2%), BI-RADS 3 in 226 (21.9 %), BI-RADS 4 in 274 (26.5%) and BI-RADS 5 in 64 (6.2%). For 49 (4.7%) mammograms the information could not be found.

When compared to the prevalence of BI-RADS 0 ,1 ,2 category breast lesions (40.7%) found in the present series, our percentage was in the middle of published prevalence in other countries such as USA, China, France and Cameroon (range 27.4 % to 94.7 %) (14, 18, 20-21). We found a similar result for the BI-RADS categories 4 and 5 with a percentage of 32.7% in our country and a percentage ranging from 0.7% to 56.9% for these others countries (14, 18, 20-21). Furthermore, for the BI-RADS 3 category, the 22 % found in our study is much higher than that reported in others reports such as USA and Europe (ranging from 2.3 to 7.7 % (23, 25-26).

It is well known that category 3 breast lesion is the one with the largest inter and intraobserver variability (20,23) and that radiologists with breast imaging experience will less likely use the BI- RADS 3 category (27). Several studies reported that the young age and a high breast density decreased the diagnostic accuracy of mammography (7, 11, 23, 27-28). In the present study, the median age of the women was 48 years and that 70% of women had low breast density level. As expected (16, 20), most of the lesions encountered on mammography in our study were microcalcifications. However, the 21.9 % BI- RADS 3 category found in our study is higher than the values reported elsewhere (16, 20). One of the radiology services (CHU A) also use the software PACS that facilitates the interpretation of the images. This leads us to believe that the high prevalence of BI-RADS 3 lesions found in our study could be related to the absence of breast radiologists and the absence of double reading.

In our series, clinical examination was normal in most cases and this can be explained by the fact that BI-RADS 3 is an infraclinic breast lesion and their detection is based on mammography screening ensuring early detection of breast cancer (8-11, 15-17). Mammography (sometimes associated with ultrasonography) is recognized as gold standard for breast cancer screening test with a sensibility of 78 % and a specificity of 99% (11). The recommended management is follow up mammography over a period of 2 years with a first control at 4-6 months, a second at 12 months and the latter at 24 months (12,15,18). After 24 months of stability or reduction in size, the patient will be downgraded in BI-RADS 2 and may return to routine screening. If the lesion demonstrates suspicious characteristics, the BI-RADS category may be upgraded and a biopsy is recommended (12).

In Gabon, as in other sub-Saharan African countries (3, 14, 27), the most important finding is the high percentage of non-compliance of this recommended short interval follow up. In our cohort, 38 (88 %) of women performed the first follow-up with only one woman having complied the recommended timing. Follow-up decrease over time from 14 % at 12 months to 5 % at 24 months without respecting deadline. Published series in the Maghreb countries (27) and in Europe or USA (26, 28) showed a compliance rate ranging from 71 to 78 % during the first control and this compliance has been shown to decrease with time.

Our data found that the main factors that reduce this compliance are women's lack of adherence to the recommended management, poor understanding of the recommendations or the lack of information about the importance of follow-up by the physician. A notion of pain felt during the mammogram, the difficulty of accessibility in the radiology department with a long waiting time and the stress induced by these series of examinations are the reasons reported in another study.

Fifty-eight (97%) of the follow-up mammograms showed regression or stability of the BI-RADS 3 lesions. These results are in agreement with different studies which find this regression of lesions after 2 years (28-29). In the present study, 2 (3%) of the women progressed to a BIRADS 4 or 5 against 5 to 12% in others

studies (26-28). This lower rate can be explained by a lack of information about evolution for 10 (14, 3%) of the BI-RADS 3 lesions in our study. Although published studies have shown that these BI-RADS 3 lesions had low rates of malignancy (2% or lower) (17, 20, 26-29) and that the recommendation for this category of lesion was regular surveillance, the difficulties of follow-up in Gabon explain why some authors such as Mayi –Tsonga (13) recommend a systematic biopsy for BI-RADS 3 lesions.

Our present study has some limitations. In addition to its retrospective nature, the sample size was small, mammography covered only localized region of the country and the mammographic images were analyzed without double interpretation by non-breast radiologists.

Conclusion

BI-RADS 3 breast lesion is a challenging category to assess. The BI-RADS recommendation for this atypical breast lesion was a short interval follow-up. This retrospective study illustrates the mammographic follow -up of BI-RADS 3 breast lesion in Libreville (Gabon) and shows the difficulties encountered with a high percentage of non- compliance of the patients to this recommended short interval follow-up. Thus, despite several limitations and the need for a well structured study, the information obtained will help to identify barriers to correcte surveillance and shows the need to explain this short interval follow-up to women. Another option for countries like ours is the systematic immediate biopsy.

Conflict of interest

The authors declare that they have no competing interests.

Author's contribution

CEA and IHK conceived the study. Redaction of the manuscrit has been done by CEA. DLL critically read the manuscript. All authors analyzed the data and approved the final manuscript.

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