Research Article

Histology of Breast Lesions Initially Classified as BIRADS 3 of the ACR on Ultrasound in Cameroonian Women

Aspects histologiques des lésions mammaires initialement classées BIRADS 3 de l'ACR à l'échographie chez la femme camerounaise

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ABSTRACT

Introduction. Breast Imaging and Data Reporting System (BIRADS) category 3, includes breast lesions classified as 'probably benign'. Monitoring is the recommended management rather than an immediate tissue sampling for lesions in this category. We sought to identify factors likely to raise the positive predictive value (PPV) for malignancy of these lesions in our context, with the aim of assessing the need to modify the existing management algorithm. **Methodology.** This was a retrospective cohort study. All records of patients whose lesions were classified as BIRADS 3 on breast ultrasound between January 2014 and December 2018 were included. The variables studied were essentially the histological patterns of these lesions. The Chi-squared and Welch's tests were used. A hypothesis test whose p value was <0.05 was considered statistically significant. **Results.** We recruited 251 patient records. The most frequently reported lesions on breast ultrasound were solid masses (76.9%) and cysts (11.1%). Almost half of the patients, that is 49.8% (125/251) had benefited from a pathology test. 27 cancer cases were detected amongst them, thus, a positive predictive value (PPV) for malignancy at 21.6% (27/125). **Conclusion.** Our study found a higher PPV for malignancy of ACR-BIRADS category 3 lesions as compared to that of existing guidelines. It may be essential to adapt a new therapeutic pathway in the management of patients with these lesions.

RÉSUMÉ

Introduction. La catégorie 3 de la Breast Imaging Reporting And Data System (BIRADS 3) regroupe les lésions mammaires probablement bénignes. Une surveillance est préconisée plutôt qu'un prélèvement d'emblée pour la prise en charge de ces lésions. Nous nous sommes proposés de rechercher les facteurs susceptibles d'élever la valeur prédictive positive de malignité desdites lésions dans notre contexte en vue d'évaluer la nécessité d'inverser leur algorithme de prise en charge. **Méthodologie.** Il s'agissait d'une étude cohorte rétrospective. Tous les dossiers des patientes dont les lésions ont été classées BIRADS 3 entre 2014 et 2018 à l'échographie mammaire dans cinq hôpitaux de référence de Yaoundé ont été inclus. Les variables étudiées étaient essentiellement les aspects : socio-cliniques, radiologiques et histologiques de ces lésions. Les tests de Khi2 et Welch ont été utilisés. Un test d'hypothèses dont la valeur p<0,05 était statistiquement significatif. **Résultats.** Nous avons recruté 251 dossiers de patientes. Les lésions les plus fréquemment retrouvées à l'échographie étaient des masses solides (76,9%) et des formations kystiques (11,1%). Près de la moitié des patientes, soit 49,8% (125/251) ont bénéficié d'un examen anatomopathologique et 27 cancers ont été détectés, soit une valeur prédictive positive de malignité à 21,6% (27/125). **Conclusion.** Notre étude a retrouvé une VPP de malignité des lésions de la catégorie BIRADS 3 de l'ACR élevée par rapport à celle des recommandations. Aussi faudrait-il penser adapter une nouvelle approche dans la prise en charge des patientes présentant ces lésions.

HIGHLIGHTS

What is already known on this topic
The management of breast lesions initially classified BIRADS 3 of the ACR by ultrasound considers them as benign. However an unknwno proportion may be malignant.

What question this study addressed
Histology of breast lesions initially classified as BIRADS 3 of the ACR by ultrasound in Cameroonian women.

What this study adds to our knowledge
21,6% of BIRADS 3 lesions are malignant, mostly invasive ductal carcinoma.

How this is relevant to practice, policy or further research
It may be necessary to revisit the management guidelines for Cameroonian women with BIRADS 3 lesions.

INTRODUCTION

Breast cancer is a neoplastic proliferation that develops within mammary gland cells. It is the most prevalent cancer worldwide and the first cause of cancer-related mortality in women, both in the developed and developing countries [1]. In sub-Saharan Africa, it is second only to uterine cervical cancer [2]. Ultrasonography is one of the imaging tools used in the diagnosis, management and surveillance of breast tumors. However, the definitive diagnosis is made through histopathologic tests. With the goal of avoiding interpersonal interpretation variability and the need for harmonization of senological imaging reports, came the birth of the ACR-BIRADS classification [3]. It is a classification system for radiological images from BIRADS 0 to BIRADS 6. For each class, there is a positive predictive value for malignancy as well as coincise management steps to follow. The third category of this classification system includes lesions whose ultrasonographic criteria are suggestive of a probably benign lesion [3]. This current study had as main objective to describe the histo-radiographical aspects of these lesions in order to evaluate the need to modify the existing management algorithm.

METHODOLOGY

Characteristics of the study and participants

We carried out a retrospective cohort study in the following University Teaching Hospitals: The Yaoundé Gyneco-Obstetric and Pediatric Hospital (YGOPH), The Yaoundé Central Hospital (HCY), The Yaoundé University Teaching Hospital (YUTH), The Yaoundé General Hospital (HGY), and The Cathedral Medical Centre (CMC) which is a private Centre. Included in this study were all patients' records whose breast lesions had been classified BIRADS 3 on breast ultrasound between January 2014 and December 2018.

Procedure of data collection

At the end of the preliminary administrative procedures, we effectively started the recruitment. This focused on 3 main points, namely recruitment in the databases of the radiology departments, recruitment in the out patient registers, recruitment of patient files in the archives of the gynecology and oncology departments. In radiology, we collected data from breast ultrasound reports classified BIRADS 3 over a period from January 1, 2014 to December 31, 2018. These reports enabled us to have a list of patients whose records were then searched for in the archives services (names of the patients, indications for the breast examination, radiological lesions found and their characteristics, the name of the radiologist who carried out the examination). In external consultation and in the archives, the question for us was establishing a list of patients having consulted for a breast symptom, then sending it the gyneco-obstetric and/or oncology departmental archives to find the medical files of these patients. The data collected in these files concerned: the general characteristics of the study population (age, place of residence, socio-professional status, gyneco-obstetric and family history, breast physical examination), histological reports (type of sample collection, sample collection time, histological type). We made phone calls to patients to complete missing information.

Data analysis

The observance of these patients in the follow up of the lesions at the various recommended appointments was studied. Data analysis was carried out with SPSS software version 21.0 and Microsoft Excel 2019. Pearson's Chi-square independence test was used to determine the existence of links between the different tables summarizing the radiological, histological aspects and the socio-demographic profile of the patients. The significance level was set at 0.05.

Ethical considerations

We first obtained a letter of ethical clearance from the ethics committee of the FMBS, University of Yaounde 1. Subsequently, the research authorizations from the directors of the hospitals as well as the heads of the departments were acquired to be able to use the files of the patients included in our study. This study did not involve any human manipulation. The human dignity of the people whose files were used during the study was protected by the anonymity of the data. In addition, the collection sheets were kept secret by the investigator to respect the confidentiality of the data collected during the study. In accordance with medical ethics, the various research authorizations were obtained before the start of the study.

RESULTS

A total of 251 breast ultrasound reports were examined and grouped into two. The first group had 125 participants, being those who underwent a pathology test despite the guideline of 'continued monitoring', recommended by the ACR-BIRADS 3 classification. The second group had 126 participants with no pathology test results. The average age of our study population was 33 years (with a standard deviation of 13,4 years) varying between 13 and 73 years.

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The most represented age group was that of [20years – 29years]. The average age at menarche was approximately 13 years (with a standard deviation of 1.4 years) varying between 11 and 23 years. Premature menarche (menarche before 12 years) was reported in 21 participants (8,3%). The average number of pregnancies was 02 (with a standard deviation of 2,4) varying between 0 and 11, while nulliparous women represented 36,2% of the studied population.

Among the 160 (63.7%) women who had been pregnant at least once in their life, we found that 83,1% had their first pregnancy before 30years of age. The average age of this first pregnancy was 22 years (with a standard deviation of 04 years) varying between 15 and 3 years. The most reported lesions were solid masses (76,9%) and cyst (11,1%). 151 parous women breast-fed their babies and the average breast-feeding period lasted 12,6months per child (with a standard deviation of 5,4 months) varying between 1 and 24months. The average age at menopause was 47,5 years (with a standard of 5,8 years) varying between 9 and 59 years and concerned 31 participants. As concerns contraception, 66 participants (26,2%) made use of at least one method of contraception.

Breast tissue cytoponction was the most used tissue sampling technique for pathology tests and was done on 106 participants (84.8%) followed by surgical biopsy on 14 participants (11.2%) then tru-cut biopsy on 05 participants (4.0%). 116 participants (92,8%) had their sampling done immediately, while 09 participants had their sampling done during their first breast ultrasound control scan. As concerns the histologic subtypes, benign tumors were the most frequent and were present in 95 participants (76,0%) with Adenofibroma taking the lead, and found present in 53 participants (55,7%) of those with benign lesions.

Table: histology of lesions(N = 125)		
Histologic subtype	Number	(%)
Malignant tumors	27	21,6
Invasive ductal carcinoma	23	18,4
Medullary carcinoma	1	0,8
Ductal carcinoma in situ	1	0,8
Mastitis carcinomatosa	1	0,8
Malignant phyllodes	1	0,8
Borderline tumors	3	2,4
Ductal hyperplasia	1	0,8
Flat epithelial atypia	2	1,6
Benign tumors	95	76,0
Adenofibroma	53	42,4
Fibrocystic breast disease	27	21,6
Inflammatory lesions	6	4,8
Mastosis	2	1,6
Lipoma	2	1,6
Mammary duct ectasia	3	2,4
Benign epithelial cyst	2	1,6

Malignant tumors were present in 27 patients (21,6%) with invasive Ductal carcinoma taking the lead, present in 23 participants (85,1%) of those with malignant lesions. The

average age of patients with malignant tumors was 41,1+/-11,4 years, with extreme ages being 27 years and 63 years. The table below shows the patient distribution according to the histologic subtype of lesion. Cancer was found in 27 patients out of 125, giving us a prevalence of 10.7%. the PPV for malignancy which corresponds to the number of cancer cases divided by the total number of participants who did pathology tests was found to be 21,6%.

DISCUSSION

As concerns tissue histology, 125 out of 251 (49,8%) participants' samples were examined, of which 116 (92%) analyses were done instantly despite recommendations of 'continued monitoring'. These findings were similar to those of a study carried out in Nigeria in 2017 wherein, 80,7% of patients carried out immediate tissue histology [4]. This could be explained by the anxiety that surrounds the discovery of a breast lesion in our context. Other studies report lower values, as was the case in a study carried in the USA in 2013 where they reported 9,8% of immediate tissue sampling and analysis [5], as well as in France in 2015 where they reported 4,9% [3]. This could be explained by the fact that the population in the developed countries are less anxious about breast lesions compared to that in the developing countries. Also, their PPV for malignancy for BI-RADS category 3 lesions match values in existing literature.

Benign lesions were the most frequent (76,0%) with Adenofibroma taking the lead. It is the most frequent benign tumor in a young African woman. Borderline tumors represented 2,4% (1 case of ductal hyperplasia and 02 cases of flat epithelial atypia). Amongst all the samples analyzed, we found 27 cancer cases (21,6%) with invasive ductal carcinoma taking the lead. Similar findings were reported in Nigeria in 2017 [4], in Burkina Faso in 2017 [6], and in France in 2015 [3]. The positive predictive value for malignancy was 21,6% (7/125), which appears higher than that of current guidelines as well as existing literature [8]. These values are similar to those reported in Cameroon in 2010 (13,3%) [7], and in Gabon in 2011 (11,0%) [9]. In Burkina Faso, a study found a PVV of 6,3% which led them to the conclusion that tissue biopsy should be recommended over continued monitoring as management for ACR BI-RADS 3 lesions. This disparity could be explained by human limitations being a major source of under-characterization of these lesions given that, other authors described other specific findings associated with these lesions which we didn't find in our study. As concerns the group of participants who didn't get a tissue pathology exam (16), it was difficult for us in our context to get reliable information concerning the evolution of these lesions, more so, monitoring schedules are rarely respected.

CONCLUSION

Breast tumors are numerous and frequent in our milieu. The BIRADS-ACR lexicon is of great essence in the reporting of breast ultrasound scans. However, in our context, it would

be necessary to revisit the management guidelines for these patients because, there exists a significantly high rate of malignity among these lesions with an estimated PPV of 21,6% in our study.

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