

# The Epidemiological, Clinical and Radiological (Echography, Mammography) Characteristics of Breast Pathologies at the Diagnostic Imaging Center (C.I.D) “Teriya” in Bamako

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**How to cite this paper:** Guindo, I., Sanogo, S., N’diaye, M., Camara, M.A., Dao, A., Goita, Y., Sow, A., Malinke, M., Coulibaly, S. and Diallo, M. (2023) The Epidemiological, Clinical and Radiological (Echography, Mammography) Characteristics of Breast Pathologies at the Diagnostic Imaging Center (C.I.D) “Teriya” in Bamako. *Open Journal of Medical Imaging*, 13, 30-39.

<https://doi.org/10.4236/ojmi.2023.131003>

**Received:** November 29, 2022

**Accepted:** March 19, 2023

**Published:** March 22, 2023

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## Abstract

Breast pathology is varied, bringing together tumor and non-tumor lesions. **Objective:** To study the contribution of the ultrasound-mammography pair in the diagnosis of breast pathologies. **Materials and Method:** This was a retrospective descriptive study, carried out over a period of 3 years (from January 2018 to December 2020) at the Diagnostic Imaging Center (C.I.D) “TERIYA” in BAMAKO. It concerned all patients who came for a mammogram/ultrasound examination of the breast. All women admitted for mammogram or breast ultrasound who were diagnosed with a breast injury during the study period were included. Incomplete records and radiological checks were not included. The variables analyzed were age, sex, clinical data, and ultrasound and mammography aspects. The devices used are: a Voluson 730 PRO ultrasound machine and a G 600T type mammography machine. **Results:** At the end of our study, we collected 254 breast pathologies on a number of 382 women, *i.e.* a frequency of 66.49%. The average age of our patients was 41 years old. The dominant clinical data were mastodynia (41.88%) and mammary nodule (21.70%). On imaging (mammo-ultrasound) the lesions predominated on the left in 36% of cases, bilateral in 28% of cases and in the upper-outer quadrants in 31.5% of cases. Tumor pathologies represented 66.54% of which 45.27% were benign mainly composed of fibro-adenoma (20.88%) and cyst (18.50%), 11.8% of

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suspected cases and 9.45% of cancers. Non-tumor pathologies represented 33.46%, mainly mastitis (16.14%), galactophoric dilations (11.02%) and abscesses (5.51%). These pathologies were classified in 50.3% in ACR2, 17.75% in ACR3 and 4, and in 14.20% in ACR5. Lymphadenopathy was present in 73.21% of cases.

## Keywords

Breast Pathologies, Ultrasound-Mammography Pair, Diagnostic Imaging Center, Bamako

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## 1. Introduction

Breast cancer represents a quarter of malignant tumors in women and is the leading cause of death from cancer in the female population of industrialized countries [1].

Complementary examinations such as ultrasound, mammography and anatomopathological examination have a place of choice in the diagnosis of breast tumors [2].

Mammography is the key examination in the screening and early diagnosis of breast lesions, hence the development of several methods to codify the universal reading of mammography images, including the BIRADS classification of the American College of Radiology (ACR). Breast ultrasound occupies a place of choice where mammography is not very efficient [3].

Most of these cancers are diagnosed at a late stage, due to economic or cultural reasons, the absence of a systematic screening policy, or insufficient exploration techniques [4].

According to the WHO, 2.3 million women suffer from breast cancer with 685,000 deaths worldwide, making it the most common cancer. In sub-Saharan Africa, half of the women who die of breast cancer are under 50 [5].

In MALI from 2008 to 2017, according to the cancer registry, breast cancer accounted for 43.38% of gynecological and breast cancers [6].

Many studies have been carried out in Mali in the field of breast cancer, however, to our knowledge, no study has specifically focused on the contribution of the ultrasound-mammography pair in the diagnosis of breast pathologies, hence the choice of theme. Whose objective is to study the clinical and radiological (ultrasound-mammography) aspects of breast pathologies.

## 2. Materials and Methods

This was a retrospective descriptive study carried out at the diagnostic imaging center (C.I.D) "TERIYA" in Bamako. It took place over a period of 03 years from January 2018 to December 2020.

In this study we analyzed the following variables: age, sex, clinical data and radiological aspects (ultrasound and mammography). All patients of any age

who had undergone breast imaging (mammography-ultrasound) were included. Incomplete records and follow-up examinations were not included. We used a type G 600T mammograph with frontal and external oblique views in all women and a Voluson 730 PRO ultrasound machine with a 7.5 - 10 MHz linear probe, the convex probe was used for gigantic breasts. The mammograms were read by two radiologists, the ultrasounds were made by these same readers. The BI-RADS classification of the American College of Radiology was used to classify the lesions. The diagnosis of breast pathology was made in the presence of any focal or diffuse lesion of the breast, tumor-like or not.

Data compilation was done with SPSS version 25.0 and Excel 2016 software.

Central tendency statistics, in particular the mean, and dispersion, in particular the extremes, were used for the age variable.

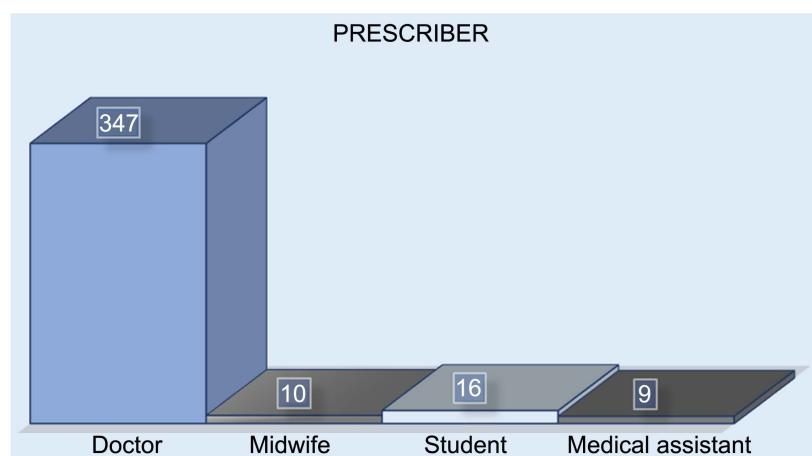
Ethical and deontological consideration: The collection of data was carried out after obtaining the authorization of the Head of the center concerned with respect for the anonymity of the patients and the confidentiality of the information.

### 3. Results

At the end of our study out of a total of 1543 mammographic examinations carried out, 382 cases benefited from an additional ultrasound. We collected 254 breast pathologies out of the 382 cases, *i.e.* a frequency of 66.49%. The workforce was composed only of women, aged between 12 - 84 years with an average age of 41.06 years. The 35 - 44 age group was the most affected with 26.7% of cases, 18.59% were women aged 55 and over.

They came from public structures in 58% of cases (**Table 1**), the prescribers were mainly doctors (**Figure 1**), mastodynia was the main symptom, followed by breast nodule (**Table 1**).

On imaging (mammo-ultrasound) the lesions were tumoral in 66.54% and non-tumorous in 33.46%. These lesions were located in the left breast in 36% of cases, bilateral in 28% of cases (**Table 2**) and the upper outer quadrants were the most affected with 31.5% of cases (**Table 3**). Tumor pathologies were benign in



**Figure 1.** Distribution of patients according to prescribers.

**Table 1.** Socio-demographic and clinical data.

Socio-demographic and clinical data	Number	Percentage
<b>Age</b>		
≤14	3	0.79
[15 - 24]	42	10.99
[25 - 34]	90	23.56
[35 - 44]	102	26.70
[45 - 54]	74	19.37
[55 - 64]	49	12.83
≥65	22	5.76
<b>Origin</b>		
Public	222	58
Private	160	42
<b>Clinical information</b>		
<b>Breast nodule</b>	102	26.70
<b>Mastodynia</b>	160	41.88
<b>Breast swelling</b>	27	7.07
<b>Breast tingling</b>	12	3.14
<b>Mastitis</b>	12	3.14
<b>Breast discharge</b>	11	2.88
<b>Health check</b>	32	8.38
<b>Control report</b>	18	4.71
<b>Other</b>	8	2.09

**Table 2.** Radiological data.

	Number	Percentage
<b>Type of pathology</b>		
Tumor	159	66.54
No tumorous	85	33.46
<b>Topography</b>		
Right	80	35.72
Left	81	36.16
Bilateral	63	28.12
<b>Type of lesion</b>		
Adenofibroma	53	20.88
Cyst	47	18.50

**Continued**

Galactophoritis/galactocele	28	11.02
Mastitis	41	16.14
Abscess	14	5.51
Suspicious tumor	30	11.81
Malignant tumor	24	9.45
Recluse disease	4	1.57
Papillomatosis	3	1.18
Intra-mammary adenopathy	5	1.97
<b>Grade of lesions</b>		
ACR2	85	50.30
ACR3	30	17.75
ACR4	30	17.75
ACR5	24	14.20

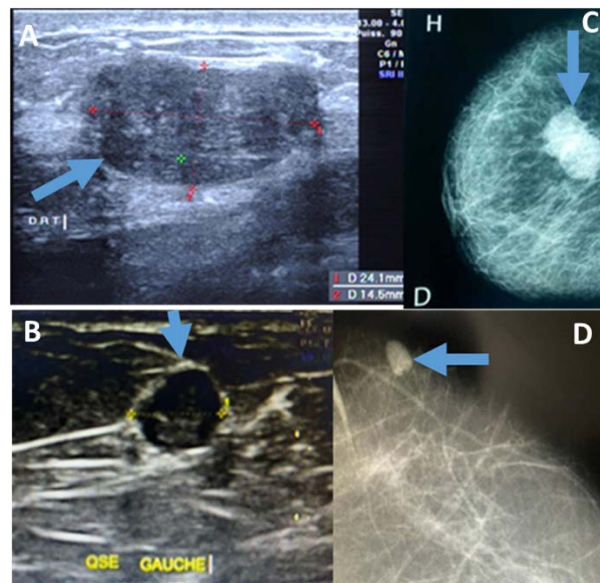
**Table 3.** Distribution of lesions according to their topography.

Topography	Number	Percentage
QSI	12	4.72
QSE	80	31.50
QII	18	7.09
QIE	14	5.51
<b>Areolar region</b>	53	20.87
<b>Whole breast</b>	42	16.54
<b>Q sup</b>	15	5.90
<b>Q lower</b>	9	3.54
<b>Q int</b>	4	1.57
<b>Q out</b>	7	2.76
<b>Total</b>	254	100.0

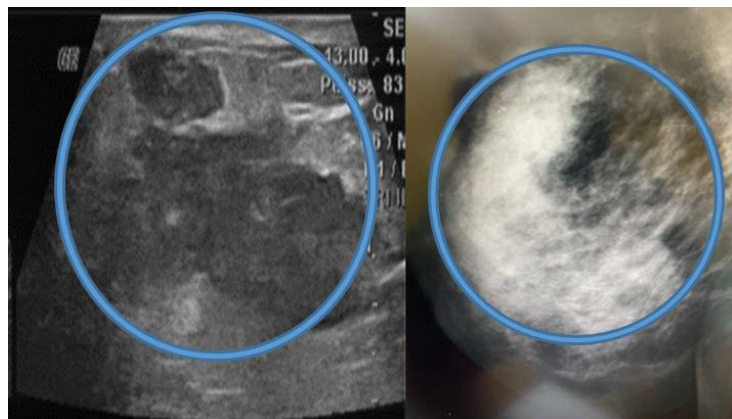
45.27% composed mainly of fibro-adenoma (20.88%) and cyst (18.50%), suspicious in 11.8% and malignant in 9.45% of cases. Non-tumor pathologies accounted for 33.46%, mainly made up of mastitis (16.14%), galactophoric dilations/galactoceles (11.02%) and abscesses (5.51%). According to the classification of the American College of Radiology, the pathologies were classified in 50.3% in ACR2, 17.75% in ACR3 and 4, and in 14.20% in ACR5 (**Table 2**).

**Figures 2-4** illustrate the iconographies of tumor and non-tumor pathologies.

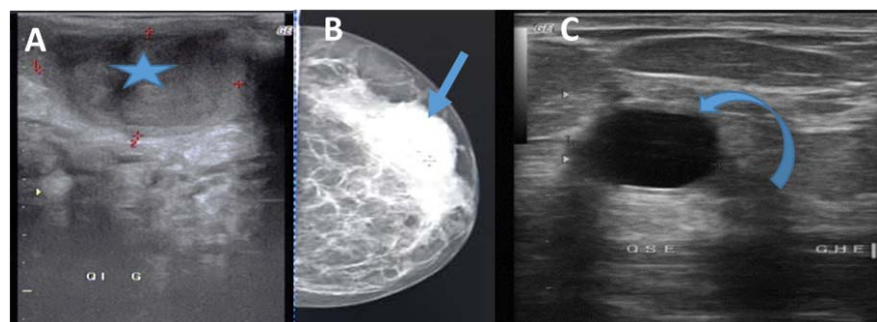
**Figures 2-4** are the iconographic illustrations that testify to breast lesions on ultrasound and mammography.



**Figure 2.** Ultrasound ((A) and (B)) and mammography ((C) and (D)) showing homogeneous lesions with clear and regular contours in favor of adenofibromas (arrow).



**Figure 3.** Ultrasound and mammography showing a bulky heterogeneous mass, with a fuzzy border evoking a malignant tumor (blue circle).



**Figure 4.** (B): mammogram showing opacity with irregular contours in the upper outer quadrant of the left breast (blue arrow), ultrasound in the same patient shows a thick-shelled echogenic fluid collection concluding in an abscess (star) (A). (C): ultrasound in another patient showing an anechoic image with posterior reinforcement without septum or internal bud: ordinary cyst (curved arrow).

## 4. Discussion

### 4.1. Epidemiological Data

In Africa, many studies have concerned breast tumors but very few studies have been done on breast pathology in general. In Mali, this study is the first to our knowledge.

Frequency:

We carried out 1543 mammographic examinations and the mammography-ultrasound couple represented 24.76% of the examinations carried out, *i.e.* 382 cases.

Of these 382 (echo-mammographic examinations), we collected 254 breast pathologies, *i.e.* 66.49%. A study carried out in 2010 in Cameroon [7] gave a similar result with 65.19%, another study carried out in Abidjan in 2007 found a lower result than ours with 39.5% of breast pathologies [8].

These different results show us a lesional variability from one region to another but with a high frequency in all cases.

Age:

Age is considered to be one of the most important risk factors for breast cancer.

The most represented age group in our series was 35 - 44 with 26.70%. The average age was 41.06 years with extremes ranging from 12 years to 84 years. This correlates with data from the African literature, for example Zaki Amal in Morocco [9] found an average age of 49 years with extreme ages between 20 and 80 years, his study mainly concerned breast cancer.

Adjenou K [10] in Benin on a series of 80 cases had extreme ages ranging from 13 - 78 years with an average age of 34 years for benign pathologies, 52 years for pathologies suspected of malignancy.

The incidence of breast cancer has an age-dependent curve: the older the age, the greater the risk, approximately 64% of women are over 55 when their cancer is diagnosed, as evidenced by a European study [11]. There are, however, breast cancers occurring at a young age and about 15% to 20% of breast cancers are diagnosed before the age of 50 [9]. This assertion is observed in the relatively young African population like ours, Keita M. [12] in 2018 obtained 14% of breast cancer in those under 35 years old out of a series of 695 cases. Young age is therefore not a necessarily low risk factor, it is necessary for us health professionals in developing countries to make every effort to evolve towards the search for genetic factors in order to better fight the scourge.

### 4.2. Clinical Data

More than half of the examination requests came from public structures with 58.38% of the cases. This is explained on the one hand by the fact that consultations are less expensive in public structures than in private ones and on the other hand by the high frequency and availability of specialists in public structures.

Most prescribers were physicians with 347 cases (90.84%). This is explained

by the fact that the breast examination is a gynecological examination and most patients are consulted by doctors specializing in gynecology and obstetrics.

Mastodynia was the most frequent clinical information with 41.88% of cases, followed by nodule in 26.70%. This same predominance of clinical data was found with 68.75% by Adjenou K [10]. As for Zaki A [9], he had the opposite with a nodule frequency of 84%. This is explained by the fact that our study and that of Adjenou K focused on all breast pathologies while that of Zaki [9] only focused on breast tumors that can evolve silently. It would be useful in areas where diagnostic means are difficult to access to focus on awareness and education in breast self-examination, which remains a means of preventing breast tumours.

### 4.3. Radiological Data

Topography of pathologies:

The seat varies according to the studies. The upper outer quadrant is the most frequent site of malignant breast tumors with 37.55% of cases [13]. This topography is explained by the ever-increasing quantity of glandular tissue in the central and upper-external part [13]. In our series, the lesions were in the left breast in 36% of cases, bilateral in 28% of cases and in the upper outer quadrant in 31.5% of cases. This predominance has been described in the European literature [14] which finds 51.9% on the left and 44.9% in the upper outer quadrant. On the other hand, in another African series, the quadrants (infero-internal and superior-external) each shared 24.3% and the right breast was the most affected [1].

The type of pathology:

Breast pathologies are varied, mainly grouping together tumoral lesions, dystrophic lesions and inflammatory lesions. They are dominated by benign pathologies as evidenced by the different series. Tumor pathologies represented 66.54% in our series among them 45.27% were benign, 11.8% suspicious and 9.45% were malignant. Non-tumor pathologies represented 33.46%, mainly made up of mastitis (16.14%), galactophoric dilatations (11.02%) and abscesses (5.51%).

This predominance of benign pathology was found in the literature, a similar study carried out in Benin by Adjenou K [10] showed that 43 patients had benign pathologies, namely: 37% fibro-adenoma, 21% solitary cysts, 16% fibrocystic mastosis, 14% fibrous dysplasia, 7% galactophoric dilatation, 2.3% post nodulectomy sequelae and 2.3% abscess. 17/60 or 28.33% had pathologies suspected of malignancy.

Another study done in Abidjan in 2007 by Taday Moussa [7] found in a series of 147 cases, 89 normal cases (60.5%), 41 cases of benign pathologies (27.8%) and 17 cases of malignant pathologies (11.7%).

Classification of lesions:

In our series we found: 50.3% of lesions classified ACR2, 17.75% ACR3 and 4, and 14.20% ACR5. This result corroborates that of Guegang E. [1] where the le-



sions were classified as ACR0 (18.4%), ACR1 (36.4%), ACR2 (33%), ACR3 (1%), ACR4 (4.9%) and ACR5 (5.8%). A contrary result was obtained by Kaoutar Lagraoui [3] in his study with 12% ACR3, 22% ACR4 and 66% ACR5 and another result obtained by Marianne [13] 17% ACR (1 and 2), 5.5% ACR3 and 69.1% ACR (4 and 5). Their high ACR4/5 levels are explained by the fact that their studies only concerned breast cancers.

These results prove to us that the BI-RADS classification of lesions according to the ACR is a predictive sign.

Lymph node damage:

Lymph node exploration concerns not only the axillary hollow, but also the interpectoral region (Rotter's lymph node), the supraclavicular hollow, the subclavicular region and, in the case of central or internal tumors, the internal mammary lymph node chain located along the intercostal spaces. The local metastasis detection rate is highly variable, thus MRI is playing an increasing role in the assessment of local extension of breast cancer, but ultrasound exploration of lymph node areas is systematic [11].

The adenopathies were present in 73.21% including 39.29% ipsilateral and 33.92% bilateral in our series, a similar result was observed in KEITA M [12] with 72.22%, the opposite results were observed in the study by Kaoutar Lagraoui [3] with 41% lymph node involvement and by Marianne [13] with 25% of cases.

Thus, in the face of any suspicion of malignancy, the radiologist suggested a cytopuncture or biopsy for histological research for better management of these patients.

## 5. The Limits and Difficulties Encountered

The main limitation is due to the retrospective nature of the study, which did not make it possible to find all the expected data, so some incomplete files were not included.

Despite these limitations, this work allowed us to appreciate the main epidemiological, clinical and radiological characteristics of breast pathologies in the center.

## 6. Conclusions

Breast pathology is common in our region, dominated by non-tumor and benign tumor lesions with, however, a relatively high frequency of cancers. It is a female pathology of all ages.

The mastodynia and the palpable nodule are the most found clinical data. Radiology, in particular the echo-mammography couple, has made it possible to detect certain infra-clinical lesions, to properly characterize all the lesions and to sort these lesions into benign, suspicious or malignant pathologies even if the certainty is histological.

Awareness, education on self-examination of the breasts and the establishment of a systematic screening system targeting women aged 40 and over throughout

the territory would make it possible to make the diagnosis of lesions infra earlier. Clinical and avoid their evolution to an advanced stage.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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