

# Epidemiological and Cytological Profile of Breast Masses with Satellite Lymphadenopathies: About 422 Cases, Collected in Dakar, Senegal

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## Abstract

**Introduction:** Breast masses with satellite adenopathies are a frequent reason for consultation, of various etiologies. Breast cancer, a major public health problem, remains the main obsession of the practitioner.

**Goals:** Describe the epidemiological and morphological profile of mammary masses with satellite adenopathies, and determine the prevalence of breast cancer in this context.

**Patients and Methodology:** A retrospective, descriptive, and analytical study from January 2012 to December 2016, based on the reports of patients who presented a breast mass associated with lymphadenopathy and cytological examination, in the laboratory of Pathological anatomy and cytology of Aristide le Dantec University Hospital.

**Results:** We counted 422 patients, of whom 98.8% were women. The study population was predominantly urban (53.6%). The average age was 38.5 years with extremes of 10 and 81 years. The consultation period was an average of 17 months. Lesions in favor of breast carcinoma accounted for 55.7% of cases and lymph node involvement was observed in 46.7% of cases. Inflammatory benign lesions (10.9%) were dominated by mastitis (42 cases or 9.9%). Noninflammatory benign lesions (29.1%) were predominantly epithelial and epithelio-conjunctive hyperplasias (20.8%)

**Conclusion:** Breast carcinoma constituted more than half of the breast mass with satellite lymphadenopathy causes, in the laboratory of Pathological anatomy and cytology of the University Hospital Aristide le Dantec.

**Keywords:** Cytology • Breast Mass • Lymphadenopathy • Cancer • Sub-Saharan Africa

## Introduction

Breast pathologies are a very heterogeneous group of conditions due to various etiologies. Among these pathologies, mammary masses are a frequent reason for consultation, especially when they are associated with locoregional lymphadenopathies. This association is a cause for concern, mainly in women, for whom breast cancer, one of the deadliest, is a real public health problem. The number of new cases of this cancer diagnosed worldwide in 2018 is estimated to 2.1 million (ranked 1st among women's cancers worldwide), representing 1 over 4 cancer cases in women [1]. In most developing countries, such as Senegal, this cancer in women is ranked second after cervical cancer, with a continuously increasing incidence and mortality [1-3]. Similarly, in Senegal, there is still a lack of reliable statistical data at national or sub-regional level, due to the lack of cancers registry. These statistical inadequacies, both in the incidence and mortality of this cancer, mask the scale of the problem and divert strategies to other priorities not less concerning (malaria, tuberculosis, HIV/AIDS, kidney failure, etc.) [4]. In practice, in order to avoid multiple uncoordinated, anxiogenic examinations, which waste precious time to the patient and incur unnecessary costs, the diagnosis of breast masses is codified and requires a rigorous clinical analysis, associated with hierarchical, para-clinical assessments, allowing

better management efficiency. Especially in the context of developing countries such as Senegal, where the lower accessibility and the cost of complementary explorations, makes early diagnosis difficult [4]. During the diagnostic process, even if certain clinical and radiological aspects are very evocative, the diagnosis must be confirmed by the pathological anatomy (cytology or histology). Mammary cytology is sufficient in cases of a matching cyto-radio-clinical triad [5,6]. Similarly, in case of breast cancer, the cytology of the satellite lymph nodes, associated with ultrasound or not, presents a good sensitivity and specificity for the detection of metastasis [7-11].

Thus, cytology associated with the clinic and imaging constitute the diagnostic tripod for mammary pathologies.

However, the efficacy and reliability of cytological diagnosis are directly related to the pathologist's experience and the technical quality of the sample. When cytology is well performed and confronted with other tests, it allows a diagnosis in more than 90% of cases. [4,5,6,12,13]. Currently in Senegal, cytology (fine needle aspiration) is widely used to diagnose the majority of breast diseases. It has some advantages, in particular it is easy to carry out, fast, allows an immediate diagnosis, accelerates the definitive management, low cost, ideal for cysts, with in this case, a dual diagnostic and evacuator role [4,7]. In sub-Saharan Africa, few studies have been devoted to the cytology of breast pathologies, even less associated with satellite lymphadenopathy, all because of the weight of the main endemic diseases. In Senegal, this situation is a more flagrant, we have not found any study concerning breast masses associated with satellite lymphadenopathy, hence, the choice of our study on breast masses with the presence of satellite lymphadenopathy chosen as the main inclusion criterion.

We therefore conducted a retrospective and descriptive study of the association of a breast mass with locoregional adenopathy in our context. The objectives of this work were to describe the epidemiological and

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morphological profile of mammary masses with satellite adenopathies and to determine the prevalence of breast cancer in this context.

## Materials and Method

Our study was conducted in the laboratory of pathological anatomy and cytology (PAC) of the University Hospital Aristide le Dantec, in Dakar. This was a retrospective, descriptive and analytical study over a 5-year period from January 1, 2012 to December 31, 2016. It focused on the cytological reports of patients presenting a breast mass with lymphadenopathy. The collection and analysis of data was identical for all patients. The studied parameters were socio-epidemiological data, antecedents, clinical and paraclinical information, topography and laterality of the mass and its macroscopic characters, the presence and macroscopic characteristics of satellite lymphadenopathy (ies), the nature of the samples, the cytological data. The data entry and analysis were done on the software Spss 20.0 Windows 8, Office 2013. The samplings are made in the pathological anatomy and cytology laboratory by specialists without ultrasound guidance. HE staining was performed for all cases, as an alternative to other recommended cytological staining including Papanicolaou and MGG.

## Results

### Descriptive study

#### a) Epidemiological data

During the study period, 422 cases had a breast mass with satellite lymphadenopathies, representing 10.6% of all mammary fine-needle aspiration or 3981 cases. Our study population was predominantly urban (53.6%) coming from Dakar. Among them, 417 cases were women (98.9%) and 5 cases were men (1.2%). The average age of patients was 38.5 years with extremes of 10 to 81 years. The patient aged of 30 to 39 years old were the most represented as shown on Figure 1 (Figure 1).

#### b) Pathology data

**Breast mass:** The consultation period was an average of 17 months. Cytology was contributive in 96.7% of cases. Breast masses were unilateral in 95.5% of cases and bilateral in the other. They had an average size of 4.2 cm with extremes ranging from 1cm to 25 cm. The mobile character was noted in 74.4% of the masses against 25.6% of the fixed masses. The super-outer quadrant is the most frequently found location of breast masses with a rate of 24.4% (Table 1).

The cytological results and the different types of pathologies found during the diagnosis are shown in the table below (Table 2).

Benign lesions consisted of inflammatory lesions (10.9%) such as mastitis (42

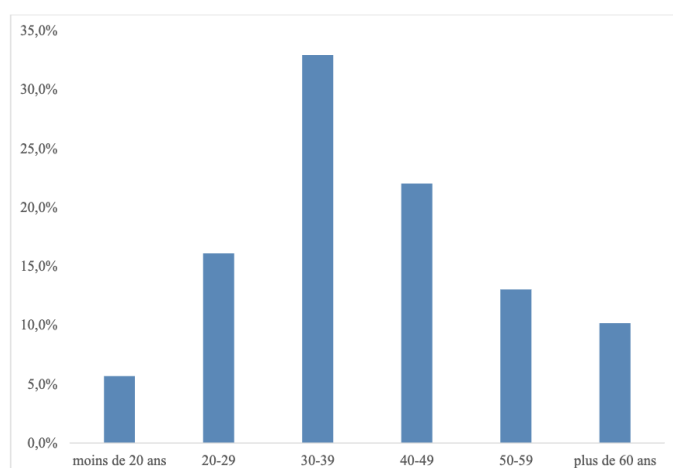


Figure 1: Distribution of the patients according to age groups.

Table 1: Distribution according to the topography.

Topography	Number (n)	Percentage (%)
Super-outer quadrant	103	24,4
Super-inner quadrant	38	9
Super quadrants union	39	9,2
Lower-outer quadrant	27	6,4
Lower-inner quadrant	17	4
Lower quadrants union	5	1,2
Outer quadrants union	20	4,7
Inner quadrants union	17	4
Retro-areolar	42	10
All the breast	60	14,2
Undetermined	54	12,8
<b>Total</b>	<b>422</b>	<b>100</b>

Table 2: Distribution according to the different cytological aspects of the lesions.

Cytological aspects	Number (n)	Percentage (%)
Malignant lesions	235	55,7
Suspicious lesions	4	1
Benign lesions	169	40
Non contributory	14	3,3
<b>Total</b>	<b>422</b>	<b>100</b>

Table 3: Analytical study.

Proof	Malignant breast lesion			
		Positive	Negative / suspect	Total
Lymph Node Involvement	Positive	197(97,5%)	5(2,5%)	202(100,0%)
	Negative	38 (17,3%)	182 (82,7%)	220(100,0%)
	<b>Total</b>	<b>235</b>	<b>187</b>	<b>422</b>

cases or 9.9%), cytotestatonecrosis (2 cases or 0.5%), ectasia galactophoritis (2 cases, 0.5%) and noninflammatory lesions (29.1%) such as epithelial and epithelio-conjunctive hyperplasia (88 cases or 20.8%), adenofibromas (13 cases or 3.1%), conjunctive lesions (7 cases, 1.7%), cystic lesions (11 cases, 2.6%) and internal mammary lymphadenopathies (4 cases, or 9.5%).

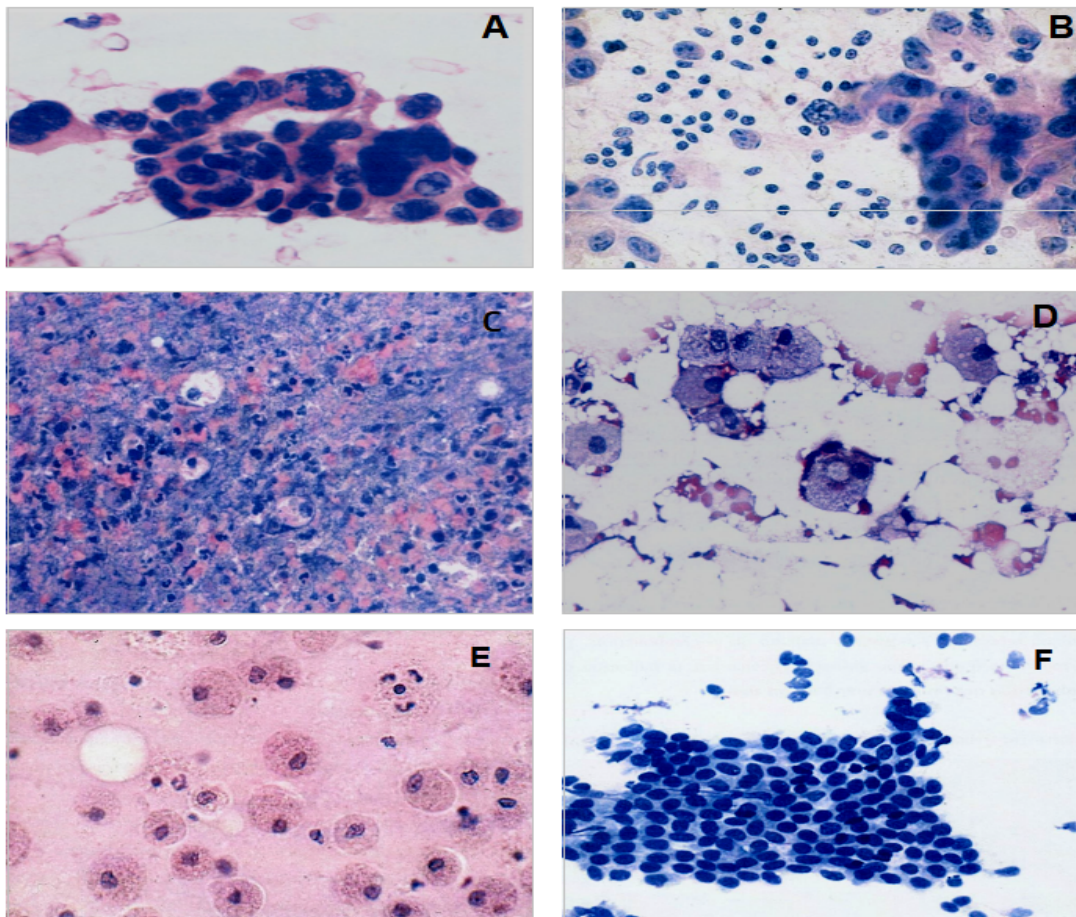
**Lymphadenopathies:** Lymphadenopathies were found in all patients (422 cases). Cytology was performed in 360 patients. It was productive in 322 cases. In our series, 46.7% of lymph node cytologies (197 cases) were in favor of lymph node invasion, compared to 29.6% (125 cases) in favor of a benign lesion, 9% (38) non-contributive, and 14.7% (62 cases) of the lymphadenopathies were not puncturable (Table 3).

The prevalence of malignant breast lesions was 97.5% in individuals with nodal involvement and 17.3% in individuals who did not present any. This difference was statistically significant with  $p < 0.001$ . Individuals with nodal involvement were 182.9 times (confidence interval = [70.5-474.2]) more likely to have a malignant lesion than individuals without ganglionic invasion. (Figure 2).

## Discussion

In our series, we noted a clear predominance of the female subjects. This predominance was attributed to the atrophic characters of the gland in the man, the delicacy of the Lactiferous ducts, the absence of acini and the abundance of the fibrous tissue [14]. Malignant or suspicious lesions were found only in women. In men, all lesions were benign, with only one case presenting intermediate grade cytonuclear atypia.

The mammary pathologies are generally pathologies of the young woman in genital activity. The average age in our series was 38.5 years with extremes



**Figure 2: Iconography.**

(A) Iconography n° 1: HE x 400 Breast Carcinoma ; (B)Iconography n° 2: Ganglion invasion with breast carcinoma: HE x 400 ; (C)Iconography n° 3: HE x 400 Breast Abscess; (D) Iconography n°4: HE x 400 Cystosteatonecrosis; (E)Iconography N° 5: HE x 400 Benign Breast Cyst; (F)Iconography N° 6: HE x 400 Breast Adenofibroma.

**Source:** Pathological Cytology Collection laboratory of Dantec Teaching Hospital

ranging from 10 to 80 years old. Studies in Africa and Asia show similar results and describe average ages between 35 and 40 years [15,16]. The frequency of breast lesions in young adult women could be explained by hormonal oestroprogestative impregnation during this period of genital activity [14,17]. The most frequent location of the breast masses is the super-outer quadrant (24.4%). The data from the literature shows that regardless of the type of cancer, the super-outer quadrant is the elective location of the breast masses. This is explained by a higher density of mammary glandular tissue in this region [18-20]. The consultation period differs from one case to another and from one country to another.

Indeed, this delay is still late in developing countries due to lack of awareness of the young population, lack of resources and access to health facilities, but also fear of the announcement of a pejorative diagnosis [21,22].

**Microscopic appearance:** In our study, 55.7% of the fine needle aspiration performed were in favor of malignancy, against 40% in favor of benignity. The questionable smears were 4 or 1%. This category falls below the range of 1.6 and 8.4% of cases cited in the literature [23]. When atypia can be marked, it becomes difficult to suspect or assert the malignancy, let alone to specify the tumor variety. Consequently, further investigation until histological control is required (Kane Gueye et al. 2017). The non-contributive cytologies are evaluated at 3.3% and would have as main causes, according to the literature [24]:

- The multiplicity of operators going hand in hand with their lack of training.
- Poorly targeted punctures in deep lesions and in small or large but diffuse ones.

- Too wide needles (left greater than 22) at the origin of an hemorrhagic sample.

- Lobular carcinoma and other hyaline and edematous fibrous stromal carcinomas.

For all these reasons, the fine needle aspiration is only valuable if it is positive. The existence of malignant cells asserts the cancer, but a negative fine needle aspiration does not allow to eliminate it formally.

During clinical examination, palpation for lymph nodes associated with a fine needle aspiration presents a good sensitivity and specificity especially in case of breast cancer associated [7].

Despite some predictive characters of metastases (hard, rounded, fixed ganglion), palpation can not always distinguish reactive or inflammatory adenopathies from the invaded lymph nodes, but in association with ultrasound the accuracy is significantly increased [25,26].

Thus, in case of breast cancer, lymph node cytology is a fundamental contribution. In addition, it allows the search for a probable loco-regional lymph node extension, which is one of the main prognostic factors and thus contributes to optimizing the therapeutic management [27-30]. In our series, cytology revealed lymph node involvement in 197 cases (46.7%). Many authors [28,31,32,33] agree that lymph node involvement increases with younger age and tumor volume. These would explain the frequency of this association in subjects under 50 in our cohort. Assessment of axillary lymph node involvement is one of the most significant negative prognostic factors for recurrence and survival [31,33-35]. It also participates in the therapeutic sanction (adjuvant chemotherapy) [36-38].



Our study also noted the interest of associating the fine needle aspiration of breast masses and the fine needle aspiration of lymph nodes, when it is possible. As proof, our cohort presented 5 patients (2.5% of the malignant lesions) with lymph node involvement while the fine needle aspiration of breast was without evidence of malignancy.

## Conclusion

Our study proves the importance of performing breast fine needle aspiration of breast masses and associated regional lymphadenopathies from the outset, especially in Senegal, a developing country. This is an inexpensive and accessible test. Breast carcinoma accounted for more than half of the breast tumor causes with lymphadenopathy. The fine needle aspiration of lymph nodes confirms cases of carcinoma with normal breast fine needle aspiration.

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