



## Retrospective study of malignant breast carcinomas in the Constantine region

Fatima Zohra Khettabi <sup>a\*</sup>, Ines Zerari <sup>a</sup>, Sana Hazar Tachour <sup>b</sup>, Boutheyna Aribi <sup>c</sup>

<sup>a</sup> Faculty of Nature and Life Sciences, university of Constantine 1, Brothers Mentouri, Constantine, 25000, Algeria

<sup>b</sup> Faculty of Medicine, university of Constantine 3, Constantine, 25000, Algeria

<sup>c</sup> Laboratory of Immunology and biological activities of natural substances, Faculty of Nature and Life Sciences, university of Constantine 1, Brothers Mentouri, Constantine, 25000, Algeria

### Abstract

Breast cancer is a major public health problem both in the world and in Algeria, is currently the most frequently diagnosed cancer and is the leading cause of death in women.

Our objective was to study the epidemiological and anatomopathological profiles of malignant mammary carcinomas and lists the different histological and immunohistochemical types on 447 samples of patients (from January 2019 to April 2022). The study was carried out in Anatomy and Pathological Cytology unity of Benbadis University-Hospital Center of Constantine (CHUC) for a period of 1 month.

The results of the study showed that breast cancer can inflict any woman at any age, but in particular it significantly affects women between 44-55 years of age, we report that the left breast is more affected than the right breast.

The most common histological type is non-specific infiltrate carcinoma with a percentage of 78.52%. The results of the molecular phenotype classification showed that the most common type was luminal B with 49% of cases, followed by luminal type A, and triple negative.

In this study, we have a high percentage of tumors classified pT1 represented by 40%, followed by tumors classified pT2, PT3, pTx.

Early detection greatly increases the chances of recovery of patients; therefore, the treatment of breast cancer can be very effective, especially if the disease is detected quickly.

### Keywords:

Breast cancer; non-specific infiltrate carcinoma (CINS); histological; immunohistochemical; luminal B.

\* Received November 15, 2024; accepted December 15, 2024

\*Corresponding author

Email address: [khettabifz98@gmail.com](mailto:khettabifz98@gmail.com) (Fatima Zohra Khettabi)

Cited as: Khettabi F. Z, Zerari I, Tachour S. H, Aribi B. Retrospective study of malignant breast carcinomas in the Constantine region.

J. Mol. Pharm. Sci. 03 (02), 2024, 11-20.

## 1. Introduction

Breast cancer is the most frequently diagnosed cancer in the world and the most common cancer in women; despite considerable progress in the treatment of breast cancer, therapeutic results remain modest and this cancer continues to disrupt the lives of millions of women [1] [2].

It is a heterogeneous, multifactorial pathology in which breast cells multiply anarchically as a result of a failure in the mechanism regulating cell growth. When it is localized around the tissue of origin, breast cancer is termed "*in situ*"; it is "invasive" when it spreads or metastatic when it affects other tissues further away [3].

The incidence of breast cancer has increased worldwide, depending on the country [4], and varies according to a number of criteria, including geographical region, ethnic origin, lifestyle and socio-economic category. Breast cancer is estimated to account for more than one million cases a year worldwide, leading to the deaths of 400,000 women [5].

In Algeria breast cancer ranks first in terms of the incidence of new cases in the three main Algerian registries; According to updated data from the Algiers, Sétif and Oran registry for 2000 to 2008, the highest incidence was observed in women in the 50-54 age groups [6].

According to the 2014 Constantine cancer registry report, breast cancer ranks first, accounting for half of all female cancers in Constantine alone (320 cases or 46.6%). 323 cases were recorded, 320 female (99.07%) and 3 male (0.93%).[7]

In 2015, the number of new cases was estimated at 11,000, representing an increase of 500 new cases per year[8]. Breast cancer is also the leading cause of cancer death in women in almost all countries, with 522,000 deaths from breast cancer recorded in 2012 (625,000 in 2018)[9].

Early detection considerably increases a patient's chances of being cured, so breast cancer treatment can be very effective, especially if the disease is detected early. Therapy has often involved a combination of ablation, radiotherapy and drug treatment (hormonal therapy, chemotherapy and/or targeted biological therapy), aimed at treating the microscopic cancer from the cancerous tumor that has spread through the blood vessels. This type of treatment can prevent the growth and spread of cancerous tumors, thereby saving lives [10].

Our work is based on a retrospective study, the aim of which was to determine the epidemiological and anatomic pathological profile and list the histological and immunohistochemical types of malignant breast carcinomas in a population of patients with breast cancer managed in the pathological anatomy department of the Centre Hospitalier Universitaire de Constantine (CHU).

## 2. Material and Methods

Our study was carried out at the Anatomy and Pathological Cytology Laboratory of Benbadis University-Hospital Center of Constantine (CHUC), Algeria.

The study population is 746 samples (biopsies, mastectomies) from patients with breast cancer for a period of three years (January 2019 to April 2022) which were recorded through our review of the archive. The samples included in our study concern carcinoma diagnoses (447 cases): distributed as follows: infiltrating carcinoma of the non-specific type (CNIS) in 351 cases (78.52%), infiltrating lobular carcinoma in 66 cases (14.77%), carcinoma *in situ* in 13 cases (2.91%), lobular carcinoma *in situ* in 6 cases (1.34%) and micro papillary carcinoma in 11 cases (2.46%) and we excluded other diagnoses from our study: benign tumors (benign phyllodes tumor) (32 cases) (4.29%), fibroadenoma (64 cases) (8.58%), dystrophic lesions (86 cases) (3.51%), inflammatory lesions (77 cases) (10.32%), exiguous specimens (3 cases) (0.40%), adenosis (4 cases) (0.54%), others (33 cases) (4.42%).

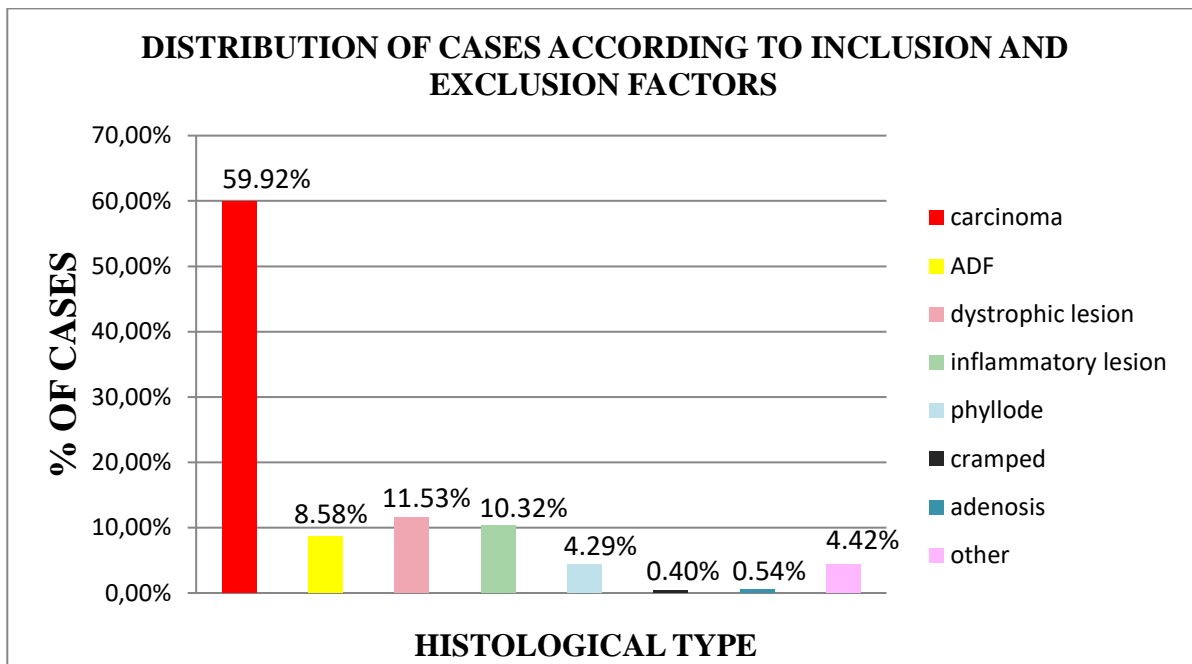
Data were collected from the patients' clinical information sheets and anatomopathological reports, a data sheet was drawn up as follows: Sex, Age, Location, Tumor size, Histological type, Molecular phenotype.

Statistical analyses were performed with Microsoft Excel.

### 3. Results and Discussion

#### *Distribution of cases according to inclusion and exclusion factors*

In our study, breast carcinoma was the most common diagnosis among patients with breast lesions, accounting for 59.92% of cases (fig.01).



**Fig 01.** Distribution of cases according to inclusion factors and exclusions

#### *Distribution of cases by gender*

In our study, which involved 447 cases of breast carcinoma, we reported a single case of male involvement (0.22%) (fig. 02).

This predominance among women is in line with the study by Zaki et al. (2013) (epidemiological and pathological profile of breast cancer in Niger), which showed that breast cancer in men remains a rare condition [11].

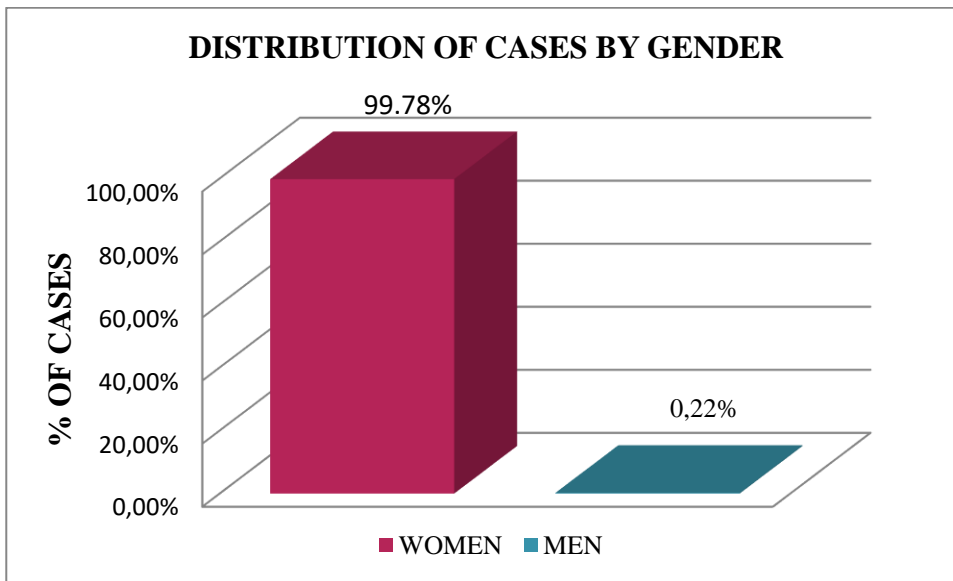


Fig 02. Distribution of cases by gender

*Distribution of cases by age groups*

Our series of studies showed that the age of the study population ranged from 25 to 95 years old and was divided into several age groups with an age difference of 10 years (figure 03).

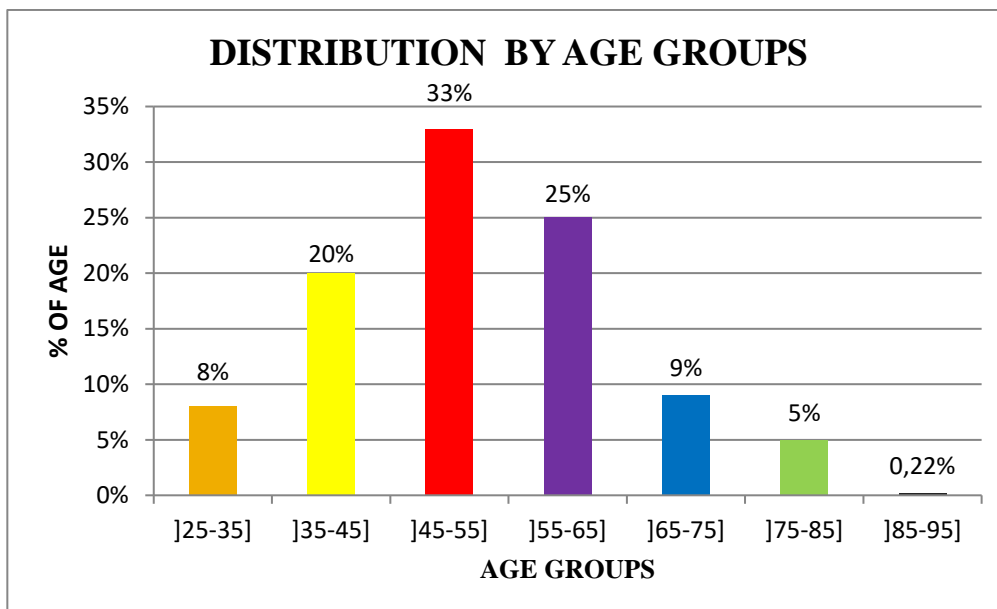


Fig 03. Distribution of cases by age group

We have noticed that breast carcinomas are more common in women whose age is in the age range] 45-55[with a rate of (33%) and a peak age of 52 years (figure04).

These results are similar to those found in the Tunisian study of (Nadjat Mahjoub et al, 2016) which showed that the average age is at the interval of 51 years [10].

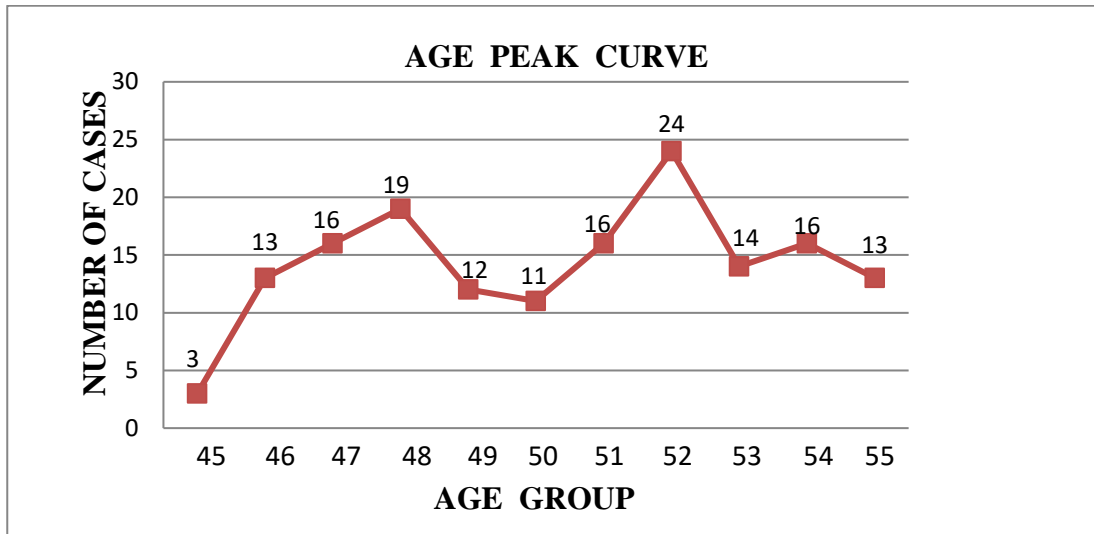


Fig 04. Age-peak curve

**Distribution of cases by location**

At the level of our study, we report that the left breast is more affected by carcinoma with a frequency of (55%) compared to the right breast which represents 45% of the locations (figure 05).

Indeed, a Cameroonian study by Jean-Paull et al, 2015 showed that the left side is more affected than the right side in breast cancer [13]. In contrast to the findings of the Bouaziz H et al, 2021 study in Ouargla, which reported a higher incidence on the left side at 52.44% compared to 45.85% on the right side, this was based on a sample group of 424 participants from 2015 to 2019[14].

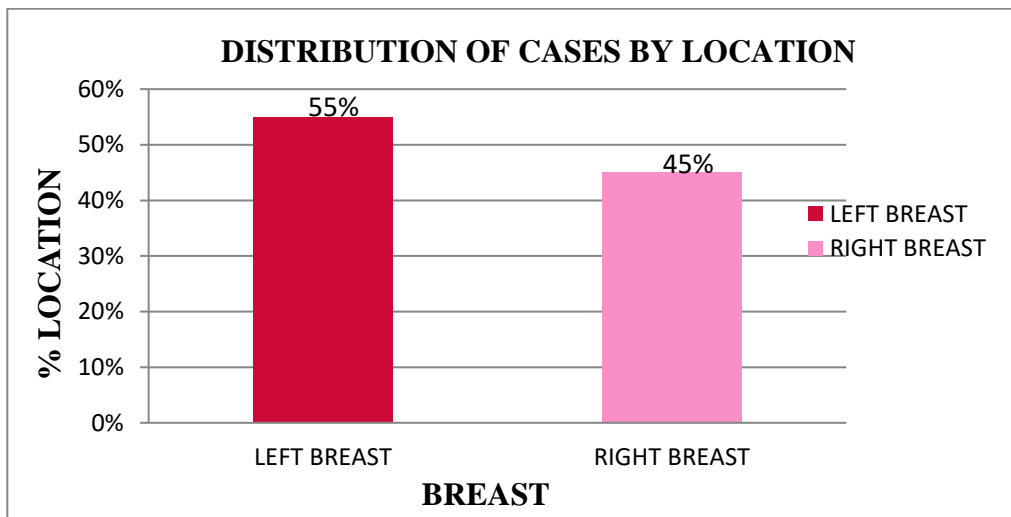


Fig 05. Distribution of cases by location

**Distribution of cases according to tumor size**

The distribution according to the size of the tumor showed that tumors classified as pT1 ( $\leq 20\text{mm}$ ) in the majority represented 40% of cases. In comparison, tumors classified as pT2 ( $20\text{mm} < \text{Tumor size} \leq 50$ ) represented 38% of cases. Moreover, (11%) of the patients present a tumor classified as pT3 (tumor size  $> 50\text{mm}$ ). In the last position comes the pT4 class with 7% of cases and the pTx class with 03% of cases. (Figure 06)

According to the study of Majdouline El Fouhi et al, 2020, they are reporting that the pT1 class is the most frequent by intake or otherwise [15].

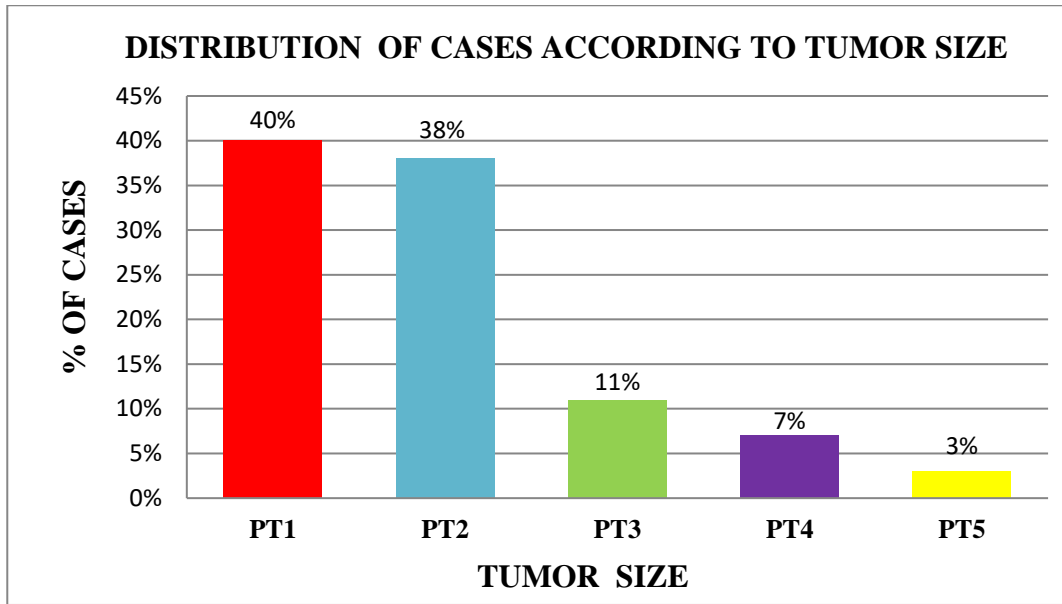


Fig 06. Distribution of cases according to tumor size

**Distribution of cases of carcinomas according to histological types**

Out of all the 447 cases of carcinoma in our study, we report the predominance of nonspecific infiltrative carcinoma (CINS) with 78.52% of cases followed by infiltrative lobular carcinoma with 14.77% of cases, carcinoma *in situ* with 2.91% of cases, micro papillary carcinoma with 2.46% of cases and lobular carcinoma *in situ* with 1.34% of cases (figure07).

The Nigerian study of Zaki et al, 2013 demonstrated that the infiltrative carcinoma of non-specific types (infiltrative carcinoma) was the most representative histological form of all cases [11].

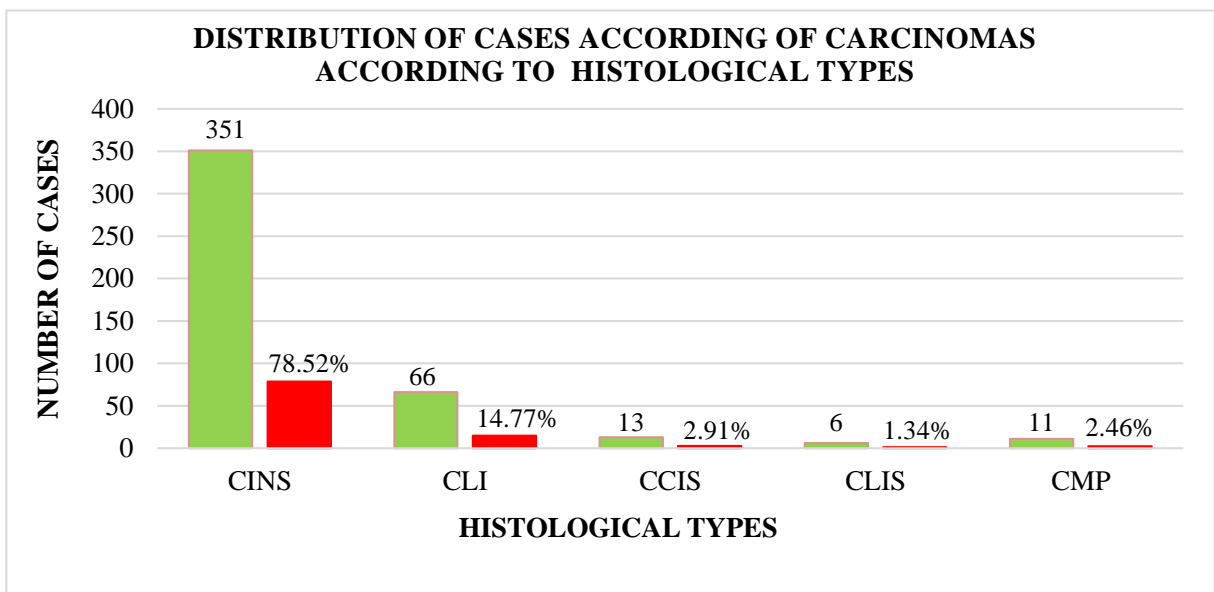


Fig07. Distribution of carcinoma cases according to histological types

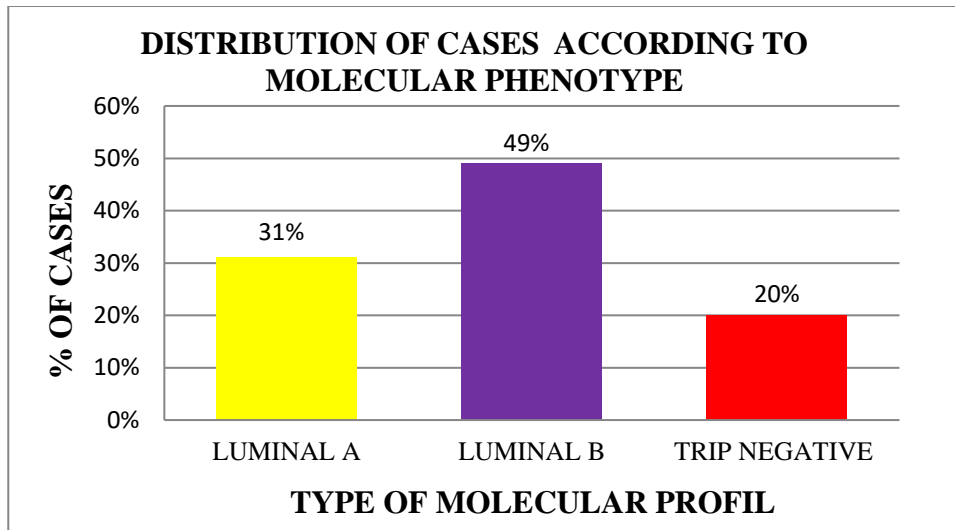


Fig 08. Distribution of cases according to molecular phenotype

#### *Distribution of cases according to molecular phenotype*

We collected 242 cases of the immunohistochemical study carried out at the level of breast biopsies and mastectomy, the distribution of which came back as follows (figure08):

- 119 **luminal B** cases (49%): is considered the most aggressive form of hormone-dependent breast cancer, requiring additional treatments to hormone therapy, such as chemotherapy (when HER2 +/-) or targeted therapy (when HER2+) [16].

- 74 **luminal A** cases (31%): These are infiltrating carcinomas of the breast of histological grade 1 or 2, expressing strongly in IHC, RE, and RP. They do not over express HER2 and have a low Ki67 proliferation index [17].

- 49 **Triple Negative** cases (20%): These are infiltrating carcinomas of the breast with a quadruple-negative phenotype, meaning they do not express RP or RA and not over expressing HER2. The majority of these tumors correspond to non-specific infiltrating carcinomas of histological grade 3 with a high Ki67 proliferation index. This category also includes carcinomas with medullary aspects and metaplastic carcinomas [17].

- No HER2+ molecular phenotype has been found.

These results correlate with the study of Nadjat Mahjoub et al, 2016 which showed the predominance of luminal group B [12].

#### 4. Conclusion and Perspectives

Breast cancer is the most common cancer among women in Algeria and throughout the world and represents a public health problem. It is a serious disease whose incidence is constantly increasing, and it is also the leading cause of cancer mortality in women.

Clinicians have observed that early detection of cancer allows for more effective curative treatments. This led them to hypothesize that identifying lesions at a preclinical stage could increase the chances of successful treatment even further. The aim of screening is to identify individuals who do not show any obvious symptoms but may have abnormalities that are likely to be cancerous or could develop into cancer. By detecting these abnormalities early, clinicians can initiate treatment promptly. [18]

Breast cancers produce few clinical signs in the early stages of their development. When they are more advanced, they can cause: [19]

- A lump or indurations (abnormal hardening) in the breast or armpit.
- An area of skin deformation, ulceration, or retraction in the breast.
- Abnormal discharge from the nipple.

As a result of organized screening and gynecological follow-up, the diagnosis is often made before these clinical signs appear. You should consult your gynecologist, who will examine the anomaly and, if necessary, prescribe further tests [19].

These signs are not specific to breast cancer and can be linked to many other breast pathologies [19].

When an abnormality is discovered by the patients herself or during a screening examination, various tests are required to confirm or refute a diagnosis of breast cancer. [19] Through the:

- ***Clinical examination***

Clinical examination of the breasts is the first step in diagnosing a breast symptom [20].

It enables the size, consistency, and mobility of any abnormality to be assessed. The doctor also observes whether the skin covering the breast changes in certain areas by asking the patient to put her arms in different positions.

He applies firm pressure with his fingers to reach deeper tissues in search of:

- Masses, including determining their size, shape, and mobility within the tissue.
- Hardening or thickening of breast tissue.
- Sensitivity or pain.

- ***Radiological examination:***

***Mammography:*** is an X-ray of the breasts. It can detect most changes in the breasts and small tumors long before they are palpable [21].



**Ecography** : is an ultrasound examination. It is a complement to mammography. It can more clearly identify benign nodules (cysts, for example), suspicious lymph nodes in the axillary hollows, or changes undetectable by palpation [21]. Ultrasound should be the first line of imaging used in pregnant women or women under 30. [20]

**MRI (magnetic resonance imaging)**: the complementary examinations are rare, and reserved for equivocal cases, but do not replace biopsy. Used for: [20]

- Women at high risk of breast cancer (>20% according to BRCAPRO or BOADICEA).
- Women with BRCA mutations.
- Women who have received radiotherapy to the thorax between the ages of 10 and 30.
- Women with genetic syndromes.

We conducted a retrospective, cross-sectional epidemiological study (39 months) on 746 patients with breast lesions, whose samples were sent to the pathology laboratory of Benbadis Constantine University Hospital (CHUC).

The data obtained in this study show that the majority of cases were carcinomas, in 447 cases (59.92%). In our study, 99.78% of cases were women, compared with men.

The age peak of patients in our study population was 52 years, with extremes ranging from 25 to 95 years. The age group most affected was between 45 and 55, with 33% of cases.

Histological, infiltrating carcinoma was the predominant type, affecting 351 cases (78.52%).

According to molecular classification, tumors of luminal phenotype B occupy first place with a frequency of (49%) of cases, while luminal phenotype A (31%), and triple-negative (20%).

We noted that the pT1 class ( $\leq 20$  mm) in the first place deposits pT2, which allows the diagnosis of tumors at an early stage.

As prospects, it would be interesting to think of some recommendations that we consider necessary to improve the prognosis of this cancer in our region and in our country:

- Establish early-stage diagnosis for early cancer detection and personalized treatment;
- Regular check-ups and screening tests;
- Organize periodic medical training days for doctors to raise their awareness of the clinical warning signs that may be detected in their patients during consultations and which should prompt a diagnosis of breast cancer;
- Organize training and awareness-raising days on prevention and breast self-examination techniques for women;
- Staying active and practicing regular activities with the adoption of a healthy diet.

## References

- [1] C. Carlberg and E. Velleuer, *Cancer Biology : How Science Works*. 2009.
- [2] J. Sims, *Breast Cancer Metastasis and Drug Resistance Challenges and Progress*, no. September. 2019.
- [3] A. Elamrani, M. Attaleb, and M. Mustapha Ennaji, "Cancer du sein : Données Actuelles Breast cancer : Current Datas Evaluation of genetic and epigenetic biomarkers for bladder cancer management View project," no. October 2014, 2013.
- [4] H. Sancho-garnier and M. Colonna, "Épidémiologie des cancers du sein Breast Cancer epidemiology Epidémiologie des cancers du sein Breast Cancer epidemiology Importance du problème : Incidence et mortalité," 2019.
- [5] F. Luis and G. Moncayo, *le cancer du sein*. 2007.
- [6] H. Boussen et al., "Épidémiologie des cancers du sein de la femme jeune en Afrique du Nord," pp. 56–68, 2010.
- [7] Benider, A., et al. (2019). Breast cancer screening program in Algeria: A pilot study in Tlemcen. *Journal of Cancer Education*, 34(5), 967-972.
- [8] F. Mansour, A. Lakehal, and L. Nezzal, "Cancer du Sein : Délais d ' Accès au Diagnostic et aux Traitements Etude Rétrospective – Batna , Algérie Août 2015 – Février 2016 Breast Cancer : Delays of Access to Diagnosis and Treatment Retrospective Study – Batna , Algeria August 2015 – February 2016," 2020.
- [9] L. F. Ferlay J, Ervik M, "Cancer Today, IARC Cancer base. Breast Cancer," 2018.
- [10] "organisation mondiale de la santé." [Online]. Available: <https://www.who.int/fr/news-room/fact-sheets/detail/breast-cancer>.
- [11] H. M. Zaki, O. Garba-Bouda, S. M. Garba, and H. Nouhou, "Profil épidémiologique et anatomopathologique du cancer du sein au Niger," *J. Africain du Cancer*, vol. 5, no. 4, pp. 185–191, 2013.
- [12] N. Mahjoub et al., "Profil épidémiologique et anatomopathologique du cancer du sein dans la région du Nord-Ouest de la Tunisie Epidemiological and anatomopathological profil of breast cancer in the region of North-West of Tunisia," vol. 99, no. 04, pp. 441–448, 2016.
- [13] J. P. N. Engbang et al., "Cancer du sein au Cameroun, profil histo-épidémiologique: À propos de 3044 cas," *Pan Afr. Med. J.*, vol. 21, pp. 2893–2917, 2015.
- [14] Hocine, BOUAZIZ , et al. "Epidemiological and Pathological Profile of Breast Cancer in Southern Algerian Women (2015-2019)." *ALGERIAN JOURNAL of HEALTH SCIENCES*, vol.03, no.04 (Décembre 2021) 70-76, 24 Aug. 2021, p. 72,
- [15] A. M. M. El Fouhi, A. Benider, A. G. Kagambega Zoewendbem, "Profil épidémiologique et anatomopathologique du cancer de sein au CHU Ibn Rochd," *Casablanca*, vol. 37, p. 41, 2020.
- [16] R. Gomes, "Histological and molecular classification of breast cancer : what do we know ?," pp. 1–8, 2020.
- [17] D. Loussouarn, "Classification OMS 2012 Facteurs pronostiques et prédictifs du cancer du sein," 2012.
- [18] B. Sérador, *Le dépistage du cancer du sein: un enjeu de santé publique*. 2007.
- [19] Dalenc and Florence, "Les cancers du sein," *Rev. Infirm.*, no. 139, pp. 14–15, 2008.
- [20] J.-C. Hogue, *La sénologie au quotidien LES DÉFIS MAMMAIRES EN PRATIQUE COURANTE*. 2014.
- [21] M. Siriwardana, S. Berigaud, A. Chebib, and E. Pautas, "Le cancer du sein," *Rev. Geriatr.*, vol. 33, no. 9, pp. 823–826, 2008.

