

Retrospective analysis of the epidemiological profile of patients undergoing breast reconstruction in a public hospital in Northeastern Brazil

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ABSTRACT

Introduction: Breast reconstruction is a right guaranteed by the public health system to patients undergoing mastectomy. The present study aimed to understand the epidemiological profile of women with breast cancer who underwent breast reconstruction at a referral hospital in the Northeast region of Brazil. **Methods:** Observational, retrospective study with an analytical character and descriptive approach. Data were collected through a sociodemographic questionnaire and clinical-surgical history, and were subsequently analyzed using SPSS version 18, with the percentages of the categories evaluated by the χ^2 test, considering a significance level of 5%. The comparison of the analyses was significant ($p < 0.005$), demonstrating that the profile described was the most frequent in the group of patients evaluated. **Results:** A non-probabilistic sample of 400 medical records was obtained from a public referral hospital in the unified health system of the Northeast Region. The majority had a mean age between 46 and 59 years (45.3%) and brown skin color (61.1%), and were married (79.1%), with education up to high school (60.7%); they were housewives (45.0%), non-smokers (84.9%), non-alcohol drinkers (94.9%) and underwent immediate reconstruction after mastectomy (70.3%). **Conclusions:** The findings support that patients with high education levels are likely to undergo immediate breast reconstruction, indicating that socioeconomic level significantly influences the rates of breast reconstruction after radical or conservative breast surgery.

KEYWORDS: breast cancer; mastectomy; epidemiology

INTRODUCTION

Breast cancer is a significant public health problem, widely recognized as a disease that most frequently affects women over 45 years of age, and it is the leading cause of cancer death in women worldwide, including women in high- and low-income countries^{1,2}. There are several factors that are linked to the emergence of this condition, including the lifestyle adopted by those affected³⁻⁷.

There are several ways for treating breast cancer, and the treatment is multidisciplinary. Depending on the stage of the disease, local or systemic treatments may be used, with more radical or conservative approaches. In recent decades, surgical treatment has evolved from the more radical Halsted surgery to more conservative surgeries with immediate reconstruction^{8,9}. Given the aggressiveness of the procedure, a search began for new, less aggressive techniques and ways to build a new breast for women who have undergone mutilating surgeries^{10,11}.

Access to information about breast reconstruction in women who have undergone such reconstruction depends on the

sociodemographic profile of these patients. It is also noted that underprivileged populations and those with lower levels of education have lower rates of breast reconstruction, which demonstrates that mastologists are less willing to give advice for immediate or delayed reconstruction^{12,13}.

In 2021, the Brazilian Society of Mastology published a note stating that, in the last decade, more than 110,000 Brazilian women underwent mastectomy through the Unified Health System (SUS) as part of their treatment for breast cancer. However, only 25,000 underwent breast reconstruction, with an increase in absolute numbers observed up to 2014, with a slight reduction up to 2017. In 2020, with the COVID-19 pandemic, there was an even sharper drop in the number of these procedures performed, worsening an already unfavorable scenario¹⁴.

It is clear that breast reconstruction and its evolution are related to several factors, namely economic, social, and psychological, which contributed to delaying its acceptance for several decades. Thus, the objective of our study was to understand the

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epidemiological profile, socioeconomic factors, clinical pathological characteristics, and the relationship between immediate and delayed breast reconstruction in a referral public health hospital in the state of Pernambuco, with the aim of understanding the association of these factors in the best way possible and changing the lives of these women.

METHODS

This was an observational, retrospective, analytical study with a descriptive approach. Four hundred patients diagnosed with breast cancer who underwent breast reconstruction and were admitted to the mastology and breast reconstruction service of the Barão de Lucena Hospital in Recife (PE) were evaluated.

To analyze the data, a database was created in a Microsoft Excel spreadsheet, which was exported to SPSS, version 18, where the analysis was performed. To evaluate the personal and clinical profile of the patients studied, the percentage frequencies were calculated, and the respective frequency distributions were constructed.

To evaluate which factors influence the histological type and the classification of the tumor, lymph nodes and metastasis (TNM), contingency tables were constructed and the χ^2 test for independence was applied. In cases where the prerequisites for applying the χ^2 test were violated, Fisher's exact test was applied. In the evaluation of the relationship between the molecular subtype and the type of surgery and reconstruction, the χ^2 test for homogeneity was applied; as well as in the evaluation of the distribution of the type of reconstruction according to the molecular subtype. All conclusions were drawn considering a significance level of 5%.

The project was submitted to and approved by the Human Research Ethics Committee of the Amaury de Medeiros Foundation, CAAE: 35568920.0.0000.5191. Data collection began in September 2021, after approval by the ethics committee.

RESULTS

Table 1 shows the distribution of the sociodemographic profile of the patients evaluated. The majority of patients were from Recife (36.0%), between 46 and 59 years old (45.3%), brown-skinned (61.0%), married (79.3%) and with completed/incomplete high school (60.7%), and they worked from home (45.0%), did not smoke (85.0%) and did not consume alcoholic beverages (95.0%).

Table 2 shows the distribution of the clinical profile of the patients evaluated. Most patients showed: delay of more than one to three months of treatment (44.2%), ductal histological type (89.0%), TNM type II (51.0%), immediate reconstruction (70.3%), chemotherapy (80.5%), radiotherapy (73.8%), and Luminal A molecular subtype (60.8%).

Table 1. Distribution of the sociodemographic profile of the patients evaluated.

Evaluated factor	n	%
Place of origin		
Recife	144	36.0
Metropolitan area	117	29.2
Interior	139	34.8
Age (years)		
Up to 30	25	6.2
31 to 45	129	32.3
46 to 59	181	45.3
60 or older	65	16.2
Skin color		
White	136	34.0
Brown	244	61.0
Black	20	5.0
Marital status		
Married	317	79.3
Single	53	13.3
Widowed	11	2.7
Divorced	19	4.7
Level of education		
No education	5	1.3
Literate	13	3.3
Elementary compl./incompl.	94	23.4
Secondary compl./incompl.	243	60.7
Higher education compl./incompl.	45	11.3
Profession		
Unemployed	14	3.4
Paid work	167	41.8
Student	15	3.8
Housewife	180	45.0
Retired	24	6.0
Smoker		
Yes	60	15.0
No	340	85.0
Alcohol drinker		
Yes	20	5.0
No	380	95.0

Table 3 shows the distribution of the type of reconstruction according to the molecular subtype. The most frequent type of reconstruction was oncoplastic flap (45.0%), followed by breast reconstruction with myocutaneous flap (GD) (23.5%) and reconstruction with prosthesis (10.3%). When analyzing the distribution of the type of reconstruction according to molecular subtype

Table 2. Distribution of the clinical profile of the patients evaluated.

Evaluated factor	n	%
Delay time (1 missing)		
Up to 1 month	148	36.8
More than 1 to 3 months	176	44.2
More than 3 to 6 months	62	15.5
More than 6 months to 1 year	2	0.5
More than 1 year	12	3.0
Histological type		
Ductal	356	89.0
Lobular	15	3.7
Others	29	7.3
TNM		
Stage 0	25	6.2
Stage I	107	26.8
Stage II	204	51.0
Stage III	60	15.0
Stage IV	4	1.0
Type of surgery		
Mastectomy	169	42.3
Quadrantectomy	231	57.7
Reconstruction time		
Immediate	281	70.3
Late	119	29.7
Chemotherapy		
Yes	322	80.5
No	78	19.5
Radiotherapy		
Yes	295	73.8
No	105	26.2
Molecular subtype		
HER 2	34	8.4
Luminal A	243	60.8
Luminal B	65	16.3
TN	58	14.5

TNM: tumor, lymph nodes and metastasis.

group, it was observed that in patients with molecular subtypes HER2, Luminal A and TN there was a higher prevalence of the oncoplastic reconstruction type with flap (41.2%, 44.9% and 36.2%, respectively), followed by the type of breast reconstruction with myocutaneous flap (GD) (35.3%, 22.2% and 34.5%, respectively). For the group of patients with molecular subtype B, the majority of patients underwent oncoplastic reconstruction with flap (55.4%), followed by the type of reconstruction with prosthesis (18.5%) (Figure 1).

DISCUSSION

We have seen significant surgical developments in breast cancer in recent years, from Halsted mastectomy to conservative surgery and the advances in breast reconstruction that occurred in the 20th century. However, with the introduction of different oncoplastic techniques, women have had a new option to improve the psychological trauma of breast loss. Breast reconstruction surgery has been widely used in the treatment of breast cancer, as it allows for the resection of large tumors while maintaining aesthetics and oncological results. Research has shown that patients who choose breast reconstruction are motivated by body image for reasons of femininity and sexuality^{15,16}.

Our results demonstrated that indicators such as socioeconomic status, origin, educational level and race did not influence the use of breast reconstruction and were considered independent factors for this type of procedure. Clough et al. found data similar to ours, as did Cristian in a study analyzing socioeconomic determinants in breast reconstruction^{17,18}. The high level of patient satisfaction in psychosocial, sexual and physical terms is associated with immediate reconstruction compared to mastectomy alone^{19,20}.

The rate of patients who underwent immediate reconstruction was 70.3%, while 29.7% underwent delayed reconstruction. These data are positive when compared to data in the literature, in which 18.5% underwent immediate reconstruction, while 9.5% underwent delayed reconstruction^{21,22}. Morrow et al. reported that approximately 25% of their patients refused to undergo breast reconstruction after mastectomy because they were afraid of

Table 3. Distribution of reconstruction type according to molecular subtype.

Reconstruction type	n	%	Molecular subtype			
			HER2 (%)	Luminal A (%)	Luminal B (%)	TN (%)
MS/Prosthesis	36	9.0	5 (14.7)	23 (9.5)	4 (6.2)	4 (6.9)
Breast reconstruction with myocutaneous flap (GD)	94	23.5	12 (35.3)	54 (22.2)	8 (12.3)	20 (34.5)
Flap with autologous tissue: TRAM	8	2.0	0 (0.0)	7 (2.9)	0 (0.0)	1 (1.7)
Reconstruction with Expander	21	5.2	1 (2.9)	14 (5.8)	2 (3.1)	4 (6.9)
Lipofilling	20	5.0	2 (5.9)	12 (4.9)	3 (4.6)	3 (5.2)
Reconstruction with prosthesis	41	10.3	0 (0.0)	24 (9.9)	12 (18.5)	5 (8.6)
Oncoplastic reconstruction with flap	180	45.0	14 (41.2)	109 (44.9)	36 (55.4)	21 (36.2)

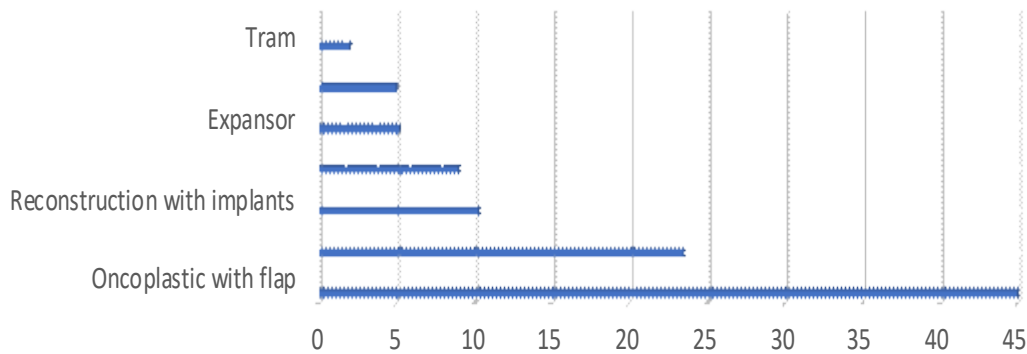


Figure 1. Distribution of patients according to type of reconstruction.

the likelihood of interference in the detection of cancer recurrence^{23,24}. The data from Morrow et al. differ from the findings of Natalie et al.: of 866 patients, 768 did not undergo conservative surgery (88.7%) and 98 (11.3%) underwent oncoplastic surgery²⁵.

A Brazilian study by Freitas-Júnior et al. from 2017 on the trend of surgeries for the treatment of breast cancer in Brazil revealed that, between January 2008 and December 2014, 193,596 surgeries were performed for the treatment of breast cancer in SUS, indicating a tendency towards a reduction in the number of simple mastectomies with some stability in the numbers of breast-conserving surgery and radical mastectomies. In addition, there was an increase in breast reconstructions using both implants and myocutaneous flaps. This study found a rate among patients who underwent mastectomy and reconstructive surgeries of 15% in 2008, with a significant increase in 2013 and 2014, of 23.7% and 29.1%, respectively²⁶.

Another interesting fact was that most of our patients were in clinical stage 0, I, and II, with 84% of patients, which allowed for more conservative surgeries and immediate reconstruction than radical mastectomy. Wu et al., in a survey of 47,123 patients treated with mastectomy alone or mastectomy followed by breast reconstruction, the staging 0, I, and II was 85%, similar to our findings, but these data were not obtained by Mansell et al.²⁷.

The most common histological type was ductal, and most patients underwent mastectomy (43.0%). In the group of patients with lobular histological type, the distribution of the type of surgery was homogeneous (33.3% for all types of surgery) and the time for immediate reconstruction was longer (73.3%). For other histological types, the majority underwent mastectomy (38.0%) and with immediate reconstruction time (79.3%). The homogeneity test was not significant in the comparison of the distribution of the type of surgery and the time for reconstruction between the different histological types ($p=0.834$ and 0.513 , respectively), indicating that the distribution of the type and time of surgery is similar in different histological types²⁸.

Regarding the molecular subtype of our patients, Luminal A was the most common, with 60% of cases, followed by Luminal B in 16%, triple-negative in 15% and HER-2 in 9%; These data are

very similar to those reported by Wu et al. in the SEER survey of the National Cancer Institute program in the United States, in which Luminal A was found in 68% of patients, with HER-2 in 6.1% and triple-negative in 13%. We observed that there was no difference between the type of breast reconstruction with the different molecular subtypes. Patients with HER-2 and triple-negative molecular subtypes underwent less immediate breast reconstruction compared to luminal tumors, and they also had a relatively higher risk of local recurrence²⁹.

In the majority of our patients who underwent oncoplastic techniques, locoregional flaps (45%), breast implants and expanders (25%) were used in almost 70% of cases, leaving reconstruction with myocutaneous flaps with the latissimus dorsi or Tram and fat grafting for selected cases and later reconstructions. Offodile et al., in a retrospective study by the American College of Surgeons, demonstrated that the most commonly used reconstruction was with breast implants and that reconstruction using flaps and implants was rarer^{30,31}.

Regarding the level of education, it was noted that patients who underwent breast reconstruction had completed high school (60.7%), and 11.3% had higher education. Thus, it was noted that the higher the level of education of the patients, the greater the search for reconstruction, as in Albrecht et al.³².

In addition, it was noted that most of the women who underwent breast reconstruction had some type of employment. The study demonstrated that 41.8% of the patients had some kind of paid job. Therefore, we can infer that women who are in the job market seek out reconstruction procedures more often³³.

CONCLUSION

The findings support the idea that patients with high levels of education are likely to undergo immediate breast reconstruction. It was also inferred that the histological type of carcinoma and the molecular subtype did not interfere with breast reconstruction. We observed that the number of immediate breast reconstructions in patients with breast cancer increased significantly.

AUTHORS' CONTRIBUTION

DLFF: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation. NCFLF: Methodology, Project

administration, Resources, Software, Supervision, Validation. TLF: Visualization, Writing – original draft, Writing – review & editing.

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