

Original Research Article

Descriptive analysis of histological types in women undergoing post-mastectomy breast reconstruction

Victor Alfonso Reyes-Gómez*, Rene Oliver Ramírez-Guerrero, Sergio G. Moreno-Hernández, Grecia C. Martínez-Martínez, Samaria E. Mejía-Rivera, Raymundo Torres-Piña

Department of Plastic and Reconstructive Surgery, Hospital General de México “Dr. Eduardo Licéaga”, México City, México

Received: 27 June 2023

Accepted: 13 July 2023

*Correspondence:

Dr. Victor Alfonso Reyes-Gómez,

E-mail: dr.victorreyes.cpr@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Breast cancer is a pathological entity that widely compromises the life and quality of life of affected women; in addition to the great affectation to the current health services. Therefore, maintaining an accurate and complete cancer registry program is one of the most important factors in implementing national cancer control programs and evaluating the results of screening, diagnosis, and treatment. Among the current limitations in the studies, there is a gap in the study of the population undergoing breast reconstruction.

Methods: A retrospective study was carried out at hospital general de México “Dr. Eduardo Licéaga” with the information from the clinical records of the period 2019-2020. Patients undergoing breast reconstruction after mastectomy with histological report were included. Through non-probabilistic sampling, a population of 138 women was formed. For data analysis, frequencies and percentages were calculated for the qualitative variables; while for the quantitative variables, mean and standard deviation were calculated.

Results: 138 women who underwent breast reconstruction were included, the mean age was 49.9 ± 10.85 years, the mean BMI was 26.80 ± 4.62 kg/m², the secondary educational level predominated (34.8%), radiotherapy was applied to 34.1%, reconstruction was late in 75.4%, the most frequent reconstruction technique was TRAM flap (44.2%), the histological type of invasive ductal carcinoma predominated (68.1%).

Conclusions: In women undergoing post-mastectomy breast reconstruction, the histological type of invasive ductal carcinoma predominates.

Keywords: Breast cancer, Mastectomy, Breast reconstruction, Histological type

INTRODUCTION

Breast carcinomas arise from the breast epithelium and cause premalignant epithelial proliferation within the ducts, termed ductal carcinoma in situ. Invasive carcinoma is characterized by cancer cells acquiring the ability to cross the basement membrane of the duct walls and infiltrate surrounding tissues.¹ Histologic type refers to the growth pattern of tumors. The most frequent type of breast carcinoma are called invasive ductal carcinomas.² This increased understanding of the heterogeneity of breast tumors, with greater emphasis

now on histological and molecular profiles, including their implications for prognosis and therapy.³

These implications are reinforced by the impact of breast cancer on global and national morbidity and mortality, which has been widely documented by various studies. It has been estimated that by the year 2022, worldwide, the numbers of breast cancer cases were estimated at 2.2 million cases, with 685,000 deaths from this cancer.⁴ Despite advances in diagnosis and treatment, 45% of the global incidence occurs in developing countries, representing 55% of all deaths. In Mexico, Globocan

estimates that the incidence and mortality of breast cancer is 39.5 and 9.9 cases per 100,000, respectively.⁵

In Mexico, as in the rest of the world, the complex and dynamic epidemiology of breast cancer is related to an increasing prevalence of risk factors, such as overweight, obesity, low breastfeeding rate, low physical activity, and high hormonal exposure.⁶ In addition to risk factors in women, institutional factors have also been described, such as: low coverage of screening mammograms, barriers to timely diagnosis, limited access to standard treatment, and suboptimal quality of health services, which predominate in the population with public health coverage.⁷

Breast reconstruction consists of recovering the volume lost after the mastectomy, either immediately in the same resection surgery or later. This reconstruction has developed greatly in recent decades and has benefited from all the successive contributions of plastic and reconstructive surgery: prostheses, expanders, and flaps (pedicled or microsurgical).⁸ Improvements in mastectomy procedures and incisions associates have produced better aesthetics, especially since the advent of the use of the nipple and areola preservation method.⁹

Breast reconstruction with prostheses is the most common reconstruction method, by far. It has the great advantage of being a simple procedure that can be performed immediately after the mastectomy without significantly prolonging the duration of surgery or hospital stay.¹⁰ Autologous reconstruction involves moving flaps of tissue into the breast, and the operations are significantly longer (4 to 10 hours), requiring 3 to 5 days in the hospital. Pedicled flaps involve the transposition of tissue while keeping the blood supply intact, such as a latissimus dorsi (LD) flap or a pedicled transverse rectus abdominis myocutaneous (TRAM) flap. The LD flap procedure is reliable and easy to perform, but often requires the addition of a breast implant to provide sufficient volume.¹¹ Reconstruction with the pedicled TRAM flap is also easier to perform, but sacrifices all of the rectus muscle, which increases the risk of hernias and abdominal bulges. Tissues that are transferred from one part of the body to another where blood vessels divide and then reconnect require microsurgical techniques (i.e., free flap procedure). Abdominal tissue is most commonly used for breast reconstruction due to its general availability and ability to provide a natural breast mound.¹²

When classifying breast reconstruction by temporality, they can be classified as immediate, deferred, or deferred immediate. In immediate reconstruction of a partial mastectomy, the goal is to simultaneously perform tumor resection with adequate margins and reconstruction. It is often referred to as "oncoplastic surgery." Immediate reconstruction is performed, whenever it is indicated and feasible to operate on non-irradiated breast tissue. Oncoplastic surgery has many advantages over delayed

breast reconstruction, such as a better cosmetic result and lower complication rates. And finally, in late reconstruction, the reconstructive surgeon waits until the postoperative and postradiotherapy changes in the deformed breast have stabilized (at least 6 months after the last treatment), to assess for breast deformities and carefully plan the appropriate reconstruction.¹³

Despite currently having a wide range of epidemiological studies in women with breast cancer, there is a gap in the histological behavior in women who have undergone breast reconstruction surgery, which is why this research is carried out with the objective of is to describe the histological types in women undergoing post-mastectomy breast reconstruction.

METHODS

A retrospective study was carried out at hospital general de México "Dr. Eduardo Licéaga" with the information from the clinical records of the period 2019-2020. Patients undergoing breast reconstruction after mastectomy with histological report were included. Patients without a histological report were excluded. The sampling was non-probabilistic, including all the patients who met the selection criteria, which were included consecutively and without blindness. Data analysis was performed by calculating frequencies and percentages for qualitative variables (scholarship, radiotherapy, timing of breast reconstruction, breast reconstruction technique, and histological type); while for the quantitative variables (age, body mass index [BMI]) mean and standard deviation (SD) were calculated.

RESULTS

The study included 138 women, of whom 59.4% (n=82) were attended in 2019 and 40.6% (n=56) were attended in 2020. The mean age was 49.9 years, with a predominance of secondary education (34.8%) (Table 1).

Table 1: Demographic characteristics of the patients.

Variables	Mean frequency	±SD %
Age (Years)	49.97	±10.85
	Illiterate	4 2.9
	Primary	22 15.9
	Secondary	48 34.8
Scholarship	Baccalaureate	22 15.9
	Technique	14 10.1
	Degree	25 18.1
	Postgraduate	3 2.2
BMI (Kg/m²)	26.80	±4.62

The clinical characteristics of the patients included the use of radiotherapy in 34.1% (n=47), a predominance of late reconstruction in 75.4% (n=104); and the most frequent use of the TRAM flap in 44.2% (n=61) (Table 2).

Table 2: Clinical characteristics of the patients.

Variables	N	Percentages (%)
Radiotherapy	47	34.1
Timing of breast reconstruction	Immediate	34 24.6
	Late	104 75.4
Breast reconstruction technique	Latissimus dorsi flap	48 34.8
	Expander	27 19.6
	TRAM flap	61 44.2
	Prosthesis	14 10.1
	Nipple-areola complex reconstruction	2 1.4
	Star flap	1 0.7
	Fasciocutaneous flap	1 0.7
	DIEP flap	8 5.8
	Reduction mammoplasty	4 2.9

The histological type that presented the most was ductal carcinoma, representing 84.0% (n=116), with the infiltrating subtype being the most prevalent (68.1%, n=94) (Table 3).

Table 3: Histological characterization of breast cancers.

Variables	N	Percentages (%)
Histological type	Ductal carcinoma <i>in situ</i>	22 15.9
	Invasive ductal carcinoma	94 68.1
	Infiltrating lobular carcinoma	7 5.1
	Paget's disease	4 2.9
	Phyllodes tumor	11 8

DISCUSSION

In the present study, a mean age of 49.97±10.85 years was found in the patients, which has been widely described; such is the case that in 2018 an age-standardized incidence rate of 19.7 cases of premenopausal breast cancer per 100,000 and 152.6 cases of postmenopausal breast cancer per 100,000 was described.¹⁴ Age is a well-established risk factor for breast cancer, since the incidence of this cancer increases with age during the reproductive years to double every 10 years until menopause. One possible explanation could be that cells become more susceptible to environmental carcinogens and biological aging modification that stimulates or enables tumor growth and metastasis.¹⁵

The BMI found had a mean of 26.80±4.62 kg/m², which corresponds to the overweight category. This increase in BMI in women with breast cancer has been reported in the fact that the increase in adiposity in childhood and before menopause is inversely associated with the risk of breast cancer diagnosed in premenopausal and postmenopausal ages, while the increased adiposity after menopause is positively associated with risk.¹⁶

Regarding the most used reconstruction technique, the TRAM flap was the most prevalent modality (44.2%). It has been reported that although autologous approaches remain less common than alloplastic reconstruction with implants, the use of the patient's own tissue has some distinctive advantages. Autologous reconstruction has the benefit of replacing "like with like," which in turn contributes to a better sense of restored "self" after mastectomy.¹⁷

Most of the patients (75.4%) underwent late reconstruction. This finding is consistent with the fact that most women who choose to undergo breast reconstruction do not undergo reconstructive surgery for the first year after mastectomy. One reason may be that patients are unable to think about reconstruction because they are involved in processing their underlying disease during the acute phase of breast cancer treatment. In addition, oncologists and surgeons also advise against early breast reconstruction, because most recurrences are seen during the first two years after breast cancer treatment.¹⁸

The two most frequent histological types in women undergoing breast reconstruction were invasive ductal carcinoma and ductal carcinoma in situ (68.1% and 15.9% respectively). Despite the fact that it was not possible to find studies that included women undergoing breast reconstruction as a population universe and that reported the histological type, this result is consistent with various series carried out, such as the study by Bilani et al who with data from the national cancer database (NCDB) during the years 2004 to 2016 included 2,671,529 women with breast cancer; finding that 73% of the cases had ductal carcinoma and 15% lobular carcinoma. The remaining histologic subtypes included <0.1% adenocarcinoma of mixed types, 0.7% papillary intraductal, 0.4% papillary, 0.9% epithelial-myoepithelial, 0.1% fibroepithelial, 0.4% metaplastic, <0.1% mesenchymal, <0.1% nipple tumors, <0.1% carcinoid tumors, <0.1% malignant lymphomas, 0.3% invasive inflammatory carcinoma, 1.6% rare breast carcinomas, and 7% other carcinomas.¹⁹

Regarding studies carried out in Mexico, Maffuz et al. Through a descriptive analysis of the clinicopathological characteristics of women diagnosed with breast cancer, from June 2005 to May 2014, of the 4411 cases diagnosed with breast cancer and according to the histopathological classification proposed by the WHO, the histological type The most frequent was ductal

carcinoma, with 78% of all cases, the less frequent types were lobular carcinoma (7.8%), mixed carcinoma (ductal and lobular) (4.2%), mucinous carcinoma (3.3%), papillary carcinoma (1.9%), metaplastic carcinoma (0.6%), tubular carcinoma (0.5%), medullary carcinoma (0.4%), Paget's disease (0.3%), micropapillary carcinoma (0.2%), and all other types (0.1% respectively).²⁰ Similarly, Medina et al conducted a retrospective study of women treated at a private tertiary health center in Mexico city from 2001 to 2016 that included a total of 240 patients. Regarding the histological type, infiltrating ductal carcinoma predominated in 59.16% of the cases, followed by ductal carcinoma *in situ* in 15.83%, infiltrating lobular carcinoma in 10.0%, and benign phyllodes in 3.3%.²¹

CONCLUSION

In women undergoing post-mastectomy breast reconstruction, the histological type of infiltrating ductal carcinoma predominates, so it is suggested to establish an adequate follow-up for these patients since recurrences may occur; In addition, late reconstruction is suggested in order to ensure the absence of recurrence.

ACKNOWLEDGEMENTS

The authors would like to thank to the authorities of the hospital general de México "Dr. Eduardo Licéaga" for the facilities provided to carry out the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

- Rakhlin A, Shvets A, Igloukov V. Deep Convolutional Neural Networks for Breast Cancer Histology Image Analysis. En: Image Analysis and Recognition. Springer Int Publishing AG. 2018;737-44.
- Weigelt B, Geyer FC, Reis JS. Histological types of breast cancer: How special are they? Mol Oncol. 2010;4(3):192-208.
- Cadoo KA, McArdle O, O'Shea AM, Power CP, Hennessy BT. Management of Unusual Histological Types of Breast Cancer. Oncologist. 2012;17(9):1135-45.
- Cejudo S, Guerrero MA, Kuri R, Martínez E, Farias F, Maldonado M. Epidemiology of Breast Cancer in Mexican Women with Obesity as a Risk Factor. Int J Mol Sci. 2022;23(18):10742.
- Ocampo A, De Ita M, Morrugaes M, Bautista A, Hernández R, Ibarra E et al. Clinical and Epidemiologic Profile of Breast Cancer Differences In Mexico: A Retrospective Cohort Study From Guerrero. Research Square. 2021;10.21203/rs.3.rs-575884/v1.
- Reynoso N, Villareal C, Soto E, Arce C, Matus J, Ramírez MT et al. Clinical and Epidemiological Profile of Breast Cancer in Mexico: Results of the Seguro Popular. J Glob Oncol. 2017;3(6):757-64.
- Martinez BA, Zertuche T, De la Rosa S, Cardona S, Canavati M, Gomez GS et al. Comparison of characteristics in Mexican women with breast cancer according to healthcare coverage. Womens Health (Lond). 2020;16:1745506520949416.
- Colwell AS, Taylor EM. Recent advances in implant-based breast reconstruction. Plast Reconstr Surg. 2020;145(2):421e-32.
- Glasberg SB. The Economics of Prepectoral Breast Reconstruction. Plast Reconstr Surg. 2017;140:49S.
- Sepúlveda S. Reconstrucción mamaria. Revista Médica Clínica Las Condes. 2016;27(1):65-75.
- Lee GK, Shekter CC. Breast Reconstruction Following Breast Cancer Treatment-2018. JAMA. 2018;320(12):1277-8.
- Colwell AS, Taylor EM. Recent Advances in Implant-Based Breast Reconstruction. Plastic Reconstructive Surg. 2020;145(2):421e-32.
- Thiessen FEF, Tjalma WAA, Tondu T. Breast reconstruction after breast conservation therapy for breast cancer. Eur J Obstet Gynecol Reprod Biol. 2018;230:233-8.
- Heer M, Harper A, Escandor N. Global burden and trends in premenopausal and postmenopausal breast cancer: a population-based study. Lancet Glob Health. 2020;8(8):e1027-37.
- Al-Ajmi K, Lophatananon A, Ollier W. Risk of breast cancer in the UK biobank female cohort and its relationship to anthropometric and reproductive factors. PLoS one. 2018;13(7):e0201097.
- The Premenopausal Breast Cancer Collaborative Group. Association of Body Mass Index and Age With Subsequent Breast Cancer Risk in Premenopausal Women. JAMA Oncol. 2018;4(11):e181771.
- Serletti JM, Fosnot J, Nelson JA. Breast Reconstruction after Breast Cancer. Plast Reconstr Surg. 2011;127:124e.
- Thamm OC, Andree C. Immediate Versus Delayed Breast Reconstruction. Clin Plast Surg. 2018;45(1):119-27.
- Bilani N, Zabor EC, Elson L, Elimimian EB, Nahleh Z. Breast Cancer in the United States: A Cross-Sectional Overview. J Cancer Epidemiol. 2020;2020:6387378.
- Maffuz A, Labastida S, Espejo A, Rodriguez S. Clinical and pathological features of breast cancer in a population of Mexico. Cir Cir. 2017;85(3):201-7.
- Medina H, Gaona P. Disparities in Breast Cancer Characteristics in Mexico. Gaceta Mexicana de Oncología. 2017;16(2):91-5.

Cite this article as: Reyes-Gómez VA, Ramírez-Guerrero RO, Moreno-Hernández SG, Martínez-Martínez GC, Mejía-Rivera SE, Torres-Piña R. Descriptive analysis of histological types in women undergoing post-mastectomy breast reconstruction. Int J Res Med Sci 2023;11:2785-8.