LUMEN ET VIRTUS

Breast reconstruction after mastectomy and contemporary challenges – Investigation of trends in breast reconstruction

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ABSTRACT

Introduction: Breast reconstruction after mastectomy is a crucial part of the recovery process for women who have faced breast cancer. However, trends in this field are constantly evolving, with new surgical techniques, technological advancements, and a deeper understanding of aesthetic and functional outcomes. Objectives: This study aims to analyze the different breast reconstruction approaches and techniques available, to evaluate the aesthetic, functional, and psychological outcomes of the different reconstruction options, to identify the challenges faced by patients, including emotional, financial, and access to health care aspects, and to investigate recent innovations and emerging trends in breast reconstruction. Methods: The present research involved a

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review of the scientific literature of the last 3 years, analyzing articles from medical journals, systematic reviews, cohort studies and randomized clinical trials related to the theme. The MEDLINE database was used with the aid of the PubMed search platform and descriptors in English to include global studies in the final search. Results: The results showed a wide range of options available for breast reconstruction, including breast implants, autologous tissue flaps, such as the use of the latissimus dorsi flap and the rectus abdominis flap, and combined reconstruction techniques. An increase in the use of nipple and areola preservation techniques was observed, as well as a greater emphasis on symmetry and the natural appearance of the final result, through lipofilling. Among the challenges faced by patients are equitable access to reconstruction care, the risks associated with reconstructive surgery, and psychosocial and emotional considerations. Conclusion: Breast reconstruction after mastectomy continues to evolve, offering patients a variety of options to restore breast form and function, which are increasingly modern and have better results. Significant challenges are still present, including issues of access to healthcare, financial costs, and the psychological impact of surgery. Continued research advancement and collaboration among health professionals are essential to address these challenges and ensure that all women have access to high-quality reconstruction options and comprehensive support.

Keywords: Breast Reconstruction, Mastectomy, Psychosocial Impact.

INTRODUCTION

Breast reconstruction after mastectomy is an essential component in the process of physical and emotional rehabilitation for women who have faced breast cancer. Mastectomy, being a surgical intervention that partially or completely removes breast tissue, can significantly impact patients' self-esteem and quality of life. The possibility of breast reconstruction offers these women not only the restoration of physical shape, but also the opportunity to reestablish their body identity and improve their psychological well-being (Cogliandro et al., 2023; Thiessen et al., 2023).

In recent decades, the field of breast reconstruction has undergone profound transformations, driven by technological advances, improvement in surgical techniques, and an increasingly sophisticated understanding of the aesthetic and functional aspects involved (Speck, Grufman, & Farhadi, 2023; Supper et al., 2023). The choice of reconstruction method, which can vary between the use of breast implants, autologous tissue flaps, or combined techniques, should be carefully considered based on the patient's individual needs, available resources, and expected outcomes (Acea Nebril et al., 2023; Wederfoort et al., 2023).

In addition to technical challenges, surgeons and patients face several contemporary issues, such as equitable access to healthcare, the costs involved, and the psychosocial effects of surgery (Dayaratna et al., 2023; Holoyda et al., 2022). There is also a growing emphasis on nipple and areola preservation, as well as symmetry and naturalness of results, which are critical factors for patient satisfaction (Choudhry et al., 2023; Hamilton, Kania & Spiegel, 2021). The multidisciplinary approach and collaboration between different medical specialties have proven to be fundamental for success (Salgarello, Visconti & Barone-Adesi, 2021).

MATERIALS AND METHODS

This study was conducted through a systematic review of the scientific literature, focusing on publications from the last three years related to breast reconstruction after mastectomy. The main objective was to analyze the contemporary trends, techniques and challenges in this field, as well as to evaluate the aesthetic, functional and psychological results of the different reconstruction options.

INCLUSION AND EXCLUSION CRITERIA

Original articles, systematic reviews, cohort studies, and randomized controlled trials published in English were included in the review. Studies focusing on breast reconstruction techniques, postoperative complications, aesthetic and functional outcomes, as well as psychological impact in patients undergoing mastectomy were considered. Studies published before 2021, non-peer-reviewed articles, individual case reports, and studies not directly related to breast reconstruction after mastectomy were excluded.

Data Sources

The search was carried out in the MEDLINE and PubMed databases, using descriptors in English such as "breast reconstruction", "mastectomy", "autologous tissue", "implants", "nipple-sparing mastectomy", and "psychosocial outcomes". In addition, specific keywords related to the reconstruction techniques were used, such as "latissimus dorsi flap", "DIEP flap", "prepectoral implant", and "fat grafting".

Search Strategy

The search strategy was developed to capture a wide range of relevant studies. Filters were used to limit the results to the last three years (2021-2024). Titles and abstracts of the retrieved articles were initially reviewed to determine eligibility. Studies that met the inclusion criteria were selected for full review.

Data Collection

Data were extracted from each included study using a standardized form that contained information about the author, year of publication, type of study, reconstruction technique analyzed, aesthetic and functional outcomes, reported complications, and psychosocial impact. Patient characteristics, such as age, comorbidities, and cancer stage, were also recorded when available.

Data Analysis

The extracted data were organized and analyzed qualitatively, focusing on trends and innovations in breast reconstruction techniques, as well as the challenges faced by patients. A comparative analysis was carried out between different reconstruction techniques, with emphasis on aesthetic and functional results and patient satisfaction. The analysis also considered aspects such as symmetry, nipple preservation, postoperative complications and sensory recovery.

GRAPH 1: DESCRIPTION OF THE STUDIES ANALYZED

Authors	*Description*
Acea Nebril et al. (2023)	This is a prospective study investigating the results of immediate breast reconstruction using prepectoral polyurethane implants. Patients undergoing this procedure were followed up to assess satisfaction and complications.
Banys-Paluchowski et al. (2024)	Retrospective evaluation of patients undergoing breast reconstruction using the latissimus dorsi muscle flap.
Cogliandro et al. (2023)	This cross-sectional study investigates patient satisfaction and quality of life after direct breast reconstruction with implants. Evaluation of the impact of the procedure on the self-image and psychological well-being of patients, using the BREAST-Q questionnaire

Hamilton et al. (2021)	*Approach to sensory recovery after mastectomy and breast reconstruction. Analysis of sensory recovery processes in areas affected by surgery and reconstruction, exploring strategies to improve sensory outcomes.*
Heine et al. (2023)	Investigation of the use of lightweight implants in breast reconstruction. Analysis of the aesthetic and functional results of these implants, comparing them with traditional options.
Holoyda et al. (2022)	Evaluation of hospitalization patterns after microvascular breast reconstruction, using data from the American College of Surgeons National Surgical Quality Improvement Program database Investigation of trends in hospital durations and associated factors.
Myers et al. (2021)	Review of alternative flap options in autologous breast reconstruction. Analysis of the efficacy and safety of different flap approaches compared to conventional techniques.
Salgarello et al. (2021)	Review of current trends in breast reconstruction, examining different approaches and techniques used in clinical practice. Discussion of the results and complications associated with these techniques.
Supper et al. (2023)	Review of updates and trends in breast reconstruction after mastectomy. Evaluation of new surgical approaches and techniques developed to improve the aesthetic and functional outcomes of breast reconstruction.
Thiessen et al. (2023)	Historical view of the evolution of breast reconstruction with free flaps. Review of the development of these techniques over time and discussion of their current clinical applications.
Wederfoort et al. (2023)	Evaluation of breast reconstruction with autologous fat transfer versus breast implants, focusing on the aesthetic evaluation of the results. Investigation of patient satisfaction and the cosmetic outcomes associated with each approach.

OWN AUTHORSHIP

GRAPH 2: KEY OBJECTIVES ANALYSED

Authors	*Main objectives*
Acea Nebril et al. (2023)	To investigate the preliminary results of immediate breast reconstruction using prepectoral polyurethane implants.
Banys-Paluchowski et al. (2024)	To evaluate the results and complications of breast reconstruction with latissimus dorsi muscle flap in a large institution
Cogliandro et al. (2023)	To assess patient satisfaction and quality of life after direct breast reconstruction with breast implants using the BREAST-Q questionnaire
Hamilton et al. (2021)	To review strategies to promote post-mastectomy sensory recovery and restore sensation in the reconstructed breast.
Heine et al. (2023)	To evaluate the aesthetic and functional outcomes of breast reconstruction with lightweight implants
Holoyda et al. (2022)	To analyze trends in length of hospital stay for microvascular breast reconstruction in the United States
Myers et al. (2021)	To review and discuss alternative flap options for autologous breast reconstruction
Salgarello et al. (2021)	Review current trends in breast reconstruction, highlighting the latest advances and emerging approaches
Supper et al. (2023)	Provides an update and discuss trends in post-mastectomy breast reconstruction
Thiessen et al. (2023)	To provide a historical overview of the evolution of breast reconstructions with free flaps over time
Wederfoort et al. (2023)	To compare the aesthetic evaluation of breast reconstruction with autologous fat transfer versus implants

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RESULTS AND DISCUSSION

The use of breast implants, especially prepectoral polyurethane implants, has been identified as a promising technique for immediate reconstruction, with lower morbidity compared to autologous techniques and good aesthetic outcomes, as reported by Acea Nebril et al. (2023). On the other hand, autologous flap techniques, such as the use of the latissimus dorsi flap and the DIEP flap,

continue to be widely used, offering more natural aesthetic results and greater long-term satisfaction, as described by Banys-Paluchowski et al. (2024) and Myers et al. (2021). Direct reconstruction with implant was also evaluated, showing high patient satisfaction, especially in unilateral or bilateral reconstruction, as observed by Cogliandro et al. (2023).

In terms of aesthetic outcomes, nipple and areola preservation has been highlighted as a technique that offers significant aesthetic benefits and lower emotional impact, as demonstrated by Choudhry et al. (2023). In addition, Wederfoort et al. (2023) observed that the use of autologous fat transfer techniques has gained preference, due to the greater naturalness and better symmetry of aesthetic results.

With regard to complications associated with the different techniques, Banys-Paluchowski et al. (2024) reported complications such as seromas and infections in the use of the latissimus dorsi muscle flap, while Holoyda et al. (2022) highlighted a reduction in hospital stay with the use of advanced microvascular techniques.

The psychosocial impact of breast reconstruction techniques was also widely discussed. Hamilton et al. (2021) emphasized the importance of post-mastectomy sensory recovery, demonstrating that the preservation or restoration of breast sensation can significantly improve the quality of life of patients. In addition, Dayaratna et al. (2023) and Salgarello et al. (2021) underlined the relevance of emotional and psychosocial aspects in assessing the outcomes of breast reconstruction, highlighting the need for continuous psychological support for patients.

GRAPH 3: MAIN FINDINGS

Authors	*Key findings*
Acea Nebril et al. (2023)	Immediate breast reconstruction with prepectoral polyurethane implants is a promising option High satisfaction rates, incidence of complications was low. Satisfactory aesthetic results and favorable postoperative recovery
Banys-Paluchowski et al. (2024)	Breast reconstruction with the latissimus dorsi muscle flap revealed encouraging results. High surgical success rates, few serious complications reported. Effective and safe option
Cogliandro et al. (2023)	Direct breast reconstruction with implants after mastectomy results in satisfactory levels of patient satisfaction and quality of life Significant improvement in self-image and psychological well-being after the procedure
Hamilton et al. (2021)	Improved sensory recovery has positive implications for patients' quality of life Latissimus dorsi muscle flaps, rectus abdominis muscle flaps, breast implants, and autologous reconstruction can restore sensation in the reconstructed breast and contribute significantly to physical and emotional recovery
Heine et al. (2023)	Lightweight implants have satisfactory aesthetic and functional results. More natural and comfortable feel Reduced risk of weight-related complications

Holoyda et al. (2022)	*Reduction in the average length of hospital stay for patients undergoing microvascular breast reconstruction* *Improved efficiency of perioperative care and postoperative management of pain and complications*
Myers et al. (2021)	Importance of individualization of the surgical plan Analysis of the details of the large dorsal muscle, abdominal challenge muscle, gluteous adipose tissue and adipose tissue of the thighs
Salgarello et al. (2021)	Reconstruction with autologous fat transfer, reconstruction with adipose-free flaps, reconstruction with perforating flaps of the thoracodorsal artery, and reconstruction with pedicled abdominal flaps are recent innovations in breast reconstruction, with the use of less invasive techniques and improved materials. Significant improvement of aesthetic and functional results
Supper et al. (2023)	Importance of an individualized approach in surgical planning. Specific considerations, such as patient preferences, breast anatomy, and surgeon experience, should guide the selection of the most appropriate reconstruction technique for each case.
Thiessen et al. (2023)	Breast reconstruction with free flaps has made significant advances in safety and efficacy over time. Better results and greater satisfaction
Wederfoort et al. (2023)	The comparison between breast reconstruction with implants and autologous fat transfer showed similar results in terms of patient satisfaction and aesthetic results. Both approaches are feasible and can be considered as breast reconstruction options

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It is notable that breast reconstruction after mastectomy continues to evolve, driven by technological advances and a better understanding of aesthetic and functional outcomes. The choice between different techniques, such as the use of breast implants and autologous flaps, is strongly influenced by factors such as the patient's personal preferences, availability of resources, and surgeon skills. In addition, complications and psychosocial impact are crucial aspects that affect the overall success of reconstruction (Acea Nebril et al., 2023; Banys-Paluchowski et al., 2024; Cogliandro et al., 2023; Myers et al., 2021).

RECONSTRUCTION TECHNIQUES

The choice between breast implants and autologous flaps remains one of the main dilemmas in the field of breast reconstruction. Implants, especially prepectoral polyurethane implants, have shown promising results in terms of simplicity and lower risk of immediate complications (Acea Nebril et al., 2023). However, autologous flaps, such as the DIEP flap and the latissimus dorsi flap, offer benefits in terms of aesthetic results and durability, but are accompanied by greater surgical

complexity and possible complications, such as seromas and infections (Banys-Paluchowski et al., 2024; Myers et al., 2021).

AESTHETIC AND FUNCTIONAL RESULTS

Aesthetic results vary significantly between techniques, with a growing trend of preference for techniques that preserve the naturalness of the breast. Nipple and areola preservation, for example, has become standard practice due to its aesthetic and emotional benefits (Choudhry et al., 2023). In addition, autologous fat transfer has gained popularity for its ability to improve the symmetry and naturalness of the result (Wederfoort et al., 2023).

ASSOCIATED COMPLICATIONS

Complications are an important consideration in choosing the reconstruction technique. The reviewed studies indicate that although implants are less invasive, autologous flaps have a higher rate of complications, which may include seromas, infections, and complications related to the donor area (Banys-Paluchowski et al., 2024). However, more recent and advanced techniques, such as microsurgery for autologous reconstruction, have shown a reduction in recovery time and postoperative complications (Holoyda et al., 2022).

PSYCHOSOCIAL IMPACT

The psychosocial impact of breast reconstruction is profound and multifaceted. Sensory recovery and preservation of self-image are central aspects for patient satisfaction. The reviewed literature highlights the importance of ongoing psychological support, especially in cases of more complex reconstruction or in patients at higher risk of complications (Hamilton et al., 2021). In addition, emotional and psychological support is essential for the well-being of patients throughout the recovery process (Dayaratna et al., 2023; Salgarello et al., 2021).

FINAL CONSIDERATIONS

Breast reconstruction after mastectomy is essential for the physical and emotional recovery of women facing breast cancer. The diversity of available techniques is highlighted, such as the use of implants and autologous flaps, with innovations that seek better aesthetic results and fewer complications. The choice of the ideal technique should be personalized, considering the patient's preferences, clinical conditions, and available resources.

Despite the advances, challenges remain, such as equitable access to care, financial costs and psychosocial impact. Ongoing psychological support and collaboration between specialists are key to improving patient outcomes and well-being.

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