Edición 5, Año 3, Número 2, 2026

E-ISSN: 3061-8045, P-ISSN: 3061-8517

Revista IECCMEXICO

Reconstrucción Mamaria Inmediata Después de Cirugía Oncológica: Selección Quirúrgica, Preservación Funcional y Resultados a Largo Plazo

Immediate Breast Reconstruction After Oncological Surgery: Surgical Decision-Making, Functional Preservation, and Long-Term Patient Outcomes

Pablo Eduardo Navarro López
Instituto Mexicano del Seguro Social
pabloenavarrolopez@hotmail.com
https://orcid.org/0009-0009-3948-0164

André Ayala Rodríguez
Universidad del Valle de México
ayalaandree30@gmail.com
https://orcid.org/0009-0009-3724-1645

Mireya Paola Almeida Alvarado
Universidad católica del Ecuador
mireyalmeida94@gmail.com
https://orcid.org/0000-0001-9353-8421

Francisco Javier Coronel Peralta
Universidad de Cuenca
fcoromed@outlook.com
https://orcid.org/0009-0007-0178-968X

Camilo José Izquierdo Flores
Independiente
camiloizquierdoflores@gmail.com
https://orcid.org/0000-0002-8670-5508

Diana Vanessa Herrera Castro
Universidad del Tolima – epidemiologia
Dianavanessaherrerac@gmail.com
https://orcid.org/0009-0007-5663-321X

Santiago Ocampo Buitrago.
Universidad de La Sabana
drsantiagoocampo@gmail.com
https://orcid.org/0009-0007-8945-2247

Daniela Saldivar Peña
Independiente
d.saldivar.pena@gmail.com
https://orcid.org/0009-0006-6853-0026

Recibido: 25-Oct-2026 | **Aceptado:** 25-Oct-2026 | **Publicado:** 30-Oct-2026

***Autor de correspondencia:** pabloenavarrolopez@hotmail.com

Cómo citar este artículo: Navarro López, P. E., Almeida Alvarado, M. P., Izquierdo Flores, C. J., Ocampo Buitrago, S., Ayala Rodríguez, A., Coronel Peralta, F. J., Herrera Castro, D. V., & Saldivar Peña, D. (2026). Immediate Breast Reconstruction After Oncological Surgery: Surgical Decision-Making, Functional Preservation, and Long-Term Patient Outcomes. México. *Revista IECCMEXICO*, 5(2, Tomo II) 1184-1204. Quality Consulting Instituto de Educación Capacitación y Certificación de México. https://ieccmexico.com/publishing

Copyright (c) 2026 Navarro López, P. E., Almeida Alvarado, M. P., Izquierdo Flores, C. J., Ocampo Buitrago, S., Ayala Rodríguez, A., Coronel Peralta, F. J., Herrera Castro, D. V., & Saldivar Peña, D.; Este es un artículo de acceso abierto distribuido bajo los términos de la Attribution 4.0 International (CC BY) Revista IECCMEXICO, México / Vol. 5, N. 2 / pp. 1184-1204/ Julio-Diciembre, 2026 / E-ISSN: 3061-8045, P-ISSN: 3061-8517. Artículo de Investigación.

RESUMEN

La reconstrucción mamaria inmediata se ha consolidado como un componente importante del tratamiento integral del cáncer de mama, al integrar la seguridad oncológica, la restauración anatómica, la preservación funcional y los resultados centrados en las pacientes. Sin embargo, la selección de la técnica reconstructiva más adecuada continúa siendo un desafío debido a las

Edition 5, Year 3, Number 2, 2026

E-ISSN: 3061-8045, P-ISSN: 3061-8517

IECCMEXICO Review

diferencias en complejidad quirúrgica, complicaciones posoperatorias, necesidad de radioterapia y satisfacción a largo plazo. El objetivo de esta revisión narrativa fue analizar los factores clínicos y reconstructivos que intervienen en la reconstrucción mamaria inmediata después de una mastectomía, con especial atención a la selección de técnicas quirúrgicas, preservación funcional y resultados comunicados por las pacientes. Se examinaron 20 publicaciones científicas correspondientes al periodo 2010-2024 mediante un enfoque descriptivo, analítico y comparativo, incorporando evidencia internacional y contribuciones latinoamericanas. Los resultados mostraron diferencias importantes en las complicaciones posoperatorias entre las técnicas basadas en implantes y las reconstrucciones autólogas, observándose que algunos procedimientos autólogos presentan mayores tasas de complicaciones generales, pero menores tasas de fallo reconstructivo. La reconstrucción prepectoral se asoció con menores probabilidades de deformidad por animación, contractura capsular y fallo protésico en comparación con la técnica subpectoral. La radioterapia posmastectomía se relacionó con un incremento del riesgo de contractura capsular grave, exposición del implante y pérdida reconstructiva. Los resultados comunicados por las pacientes evidenciaron mayor satisfacción mamaria, bienestar psicosocial y bienestar sexual a largo plazo después de la reconstrucción autóloga en determinadas poblaciones. La evidencia latinoamericana permitió identificar cambios en las prácticas reconstructivas y diferencias regionales en los recursos sanitarios. En conjunto, los hallazgos respaldan una planificación reconstructiva individualizada que priorice la seguridad oncológica e incorpore las características anatómicas, los resultados funcionales, los tratamientos previstos y las preferencias de las pacientes. Se requieren investigaciones prospectivas multicéntricas con evaluaciones funcionales estandarizadas y seguimiento prolongado para fortalecer la evidencia comparativa y optimizar las decisiones reconstructivas.

PALABRAS CLAVE

Reconstrucción mamaria inmediata, cáncer de mama, mastectomía, reconstrucción con implantes, reconstrucción autóloga, preservación funcional, reconstrucción prepectoral, radioterapia posmastectomía, complicaciones reconstructivas, resultados reportados por las pacientes, BREAST-Q, calidad de vida

ABSTRACT

Immediate breast reconstruction has become an important component of comprehensive breast cancer management, integrating oncological safety, anatomical restoration, functional preservation, and patient-centered outcomes. However, selecting the most appropriate reconstructive technique remains challenging because of differences in surgical complexity, postoperative complications, radiotherapy requirements, and long-term satisfaction. This narrative review aimed to analyze the clinical and reconstructive factors influencing immediate breast reconstruction following mastectomy, emphasizing surgical technique selection, functional preservation, and patient-reported outcomes. Twenty scientific publications from 2010 to 2024 were examined through a descriptive, analytical, and comparative approach, incorporating international evidence and contributions from Latin America. The findings demonstrated considerable variability in postoperative complications among implant-based and autologous techniques, with some autologous procedures presenting higher overall complication rates but lower reconstructive failure rates. Prepectoral reconstruction was associated with reduced odds of animation deformity, capsular contracture, and prosthesis failure compared with subpectoral placement. Postmastectomy radiotherapy was associated with increased risks of severe capsular contracture, implant exposure, and reconstructive failure. Patient-reported outcomes indicated greater long-term breast satisfaction, psychosocial well-being, and sexual well-being following autologous reconstruction in selected populations. Evidence from Latin America documented changes in reconstructive practices and highlighted regional differences in healthcare resources. Overall, the findings support individualized reconstructive planning that prioritizes oncological safety while incorporating anatomical characteristics, functional outcomes, anticipated treatments, and patient preferences. Further prospective multicenter studies with standardized functional assessments and long-term follow-up are needed to strengthen comparative evidence and improve reconstructive decision-making.

KEYWORDS

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Immediate breast reconstruction, breast cancer, mastectomy, implant-based reconstruction, autologous reconstruction, functional preservation, prepectoral reconstruction, postmastectomy radiotherapy, reconstructive complications, patient-reported outcomes, BREAST-Q, quality of life

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

INTRODUCCIÓN

Breast cancer remains a major global health challenge, and advances in surgical treatment have increasingly emphasized the importance of preserving quality of life alongside oncological safety. Mastectomy, although necessary in selected clinical circumstances, can produce substantial physical, psychological, and aesthetic consequences that extend beyond the immediate postoperative period. In this context, immediate breast reconstruction has become an important component of comprehensive breast cancer management, offering the possibility of restoring breast contour during the same surgical procedure. Nevertheless, determining the most appropriate reconstructive approach remains complex because anatomical characteristics, oncological requirements, anticipated adjuvant therapies, and individual expectations must be considered simultaneously (Zhang et al., 2017; Pusic et al., 2017).

Immediate reconstruction encompasses several surgical strategies, including direct-to-implant reconstruction, two-stage tissue expansion, and autologous tissue transfer. Each technique presents distinct advantages and limitations regarding postoperative complications, aesthetic stability, functional preservation, and long-term satisfaction. Comparative investigations have demonstrated meaningful differences in complication profiles and patient-reported outcomes between reconstructive approaches, emphasizing that technical feasibility alone should not determine surgical selection (Basta et al., 2015; Bennett et al., 2018). Furthermore, the increasing adoption of prepectoral reconstruction and nipple-sparing mastectomy has expanded reconstructive possibilities while introducing additional considerations related to tissue viability, implant positioning, and oncological safety (Headon et al., 2016; Ostapenko et al., 2023).

Functional preservation represents another essential dimension of reconstructive planning. Surgical decisions involving the pectoralis major muscle, abdominal donor sites, and surrounding soft tissues may influence postoperative discomfort, mobility, muscular function, and recovery. At the same time, radiotherapy presents a particular challenge because it can affect tissue quality, wound healing, capsular contracture, and reconstructive durability. Available evidence supports individualized assessment of reconstructive timing and technique when postmastectomy radiotherapy is anticipated, although uncertainty persists regarding the optimal approach for specific clinical subgroups (Schaverien et al., 2013; Zugasti & Hontanilla, 2021; Ren et al., 2024).

Beyond surgical outcomes, contemporary research increasingly recognizes patient-reported measures as fundamental indicators of reconstructive success. Studies using the BREAST-Q have demonstrated the importance of evaluating breast satisfaction, psychosocial well-being, physical comfort, and sexual well-being rather than relying exclusively on conventional complication rates (Santosa et al., 2018). However, the availability of reconstructive options and specialized surgical services differs considerably across healthcare systems. Evidence from Latin America illustrates the relevance of institutional resources, access to reconstructive procedures, and regional clinical experience when interpreting international recommendations (Rancati et al., 2017; Groth et al., 2020).

These considerations raise an important clinical question: **How can immediate breast reconstruction techniques be selected to achieve an appropriate balance between oncological safety, functional preservation, postoperative complications, and patient-centered reconstructive outcomes?** To address this question, the present narrative review examines international scientific literature, incorporating contributions from Latin America, to compare established and emerging reconstructive strategies. The analysis focuses on surgical selection criteria, functional consequences, interactions with oncological treatment, complications, and long-term reconstructive results. By integrating these dimensions, this review aims to provide a clinically relevant framework for individualized decision-making in immediate postmastectomy breast reconstruction.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

DESARROLLO

Clinical and Oncological Considerations in Immediate Breast Reconstruction

Immediate breast reconstruction has become an essential component of multidisciplinary breast cancer management, requiring coordination between breast surgeons, plastic surgeons, oncologists, and rehabilitation specialists. Its clinical relevance extends beyond anatomical restoration, as reconstructive decisions can influence postoperative recovery, treatment continuity, physical functionality, and long-term quality of life. However, the selection of an appropriate technique must remain subordinate to oncological safety, particularly when tumor extension, skin involvement, or the anticipated need for adjuvant radiotherapy may influence surgical planning (Zhang et al., 2017; Yamashita et al., 2021).

Patient selection involves evaluating tumor characteristics, breast volume, skin envelope integrity, previous surgical interventions, body mass index, smoking status, and associated comorbidities. The feasibility of skin-sparing or nipple-sparing mastectomy also influences reconstructive possibilities. Headon et al. (2016) demonstrated that nipple-sparing mastectomy may provide acceptable oncological outcomes in appropriately selected populations, although adequate assessment of tumor location, nipple involvement, and surgical margins remains fundamental. Similarly, Rancati et al. (2017) emphasized the importance of preoperative breast imaging and anatomical evaluation when considering direct-to-implant reconstruction following nipple-sparing mastectomy.

Selection of Reconstructive Techniques

Contemporary reconstructive strategies are primarily divided into implant-based and autologous procedures. Implant-based reconstruction includes direct-to-implant placement and two-stage reconstruction using temporary tissue expanders followed by permanent implants. These approaches generally avoid additional donor-site morbidity and may involve shorter initial operative times. Nevertheless, they remain susceptible to infection, capsular contracture, implant exposure, and reconstructive failure, particularly when local tissue conditions are compromised (Basta et al., 2015; Bennett et al., 2018).

Autologous reconstruction uses vascularized tissue obtained from anatomical donor sites, including the abdomen, back, or thigh. Procedures involving deep inferior epigastric perforator (DIEP) flaps can provide natural breast volume and tissue characteristics while limiting abdominal muscle sacrifice. However, these techniques require greater operative complexity, specialized surgical resources, and careful evaluation of donor-site complications. In a multicenter study involving 2,343 patients, Bennett et al. (2018) reported an overall complication rate of 32.9% within two years, with significant differences among reconstructive techniques. Although several autologous procedures demonstrated higher overall complication risks than expander-implant reconstruction, prosthetic approaches presented greater rates of reconstructive failure. These findings reinforce the importance of differentiating postoperative morbidity from the definitive loss of reconstruction.

The choice between implant-based and autologous procedures should therefore consider the expected benefits over time rather than focusing exclusively on initial surgical complexity. Age, anatomical suitability, tissue availability, previous radiation exposure, and personal preferences may substantially influence the balance between surgical risk and reconstructive durability (Santosa et al., 2018; Ren et al., 2024).

Functional Preservation and Anatomical Integrity

Functional preservation has gained increasing importance in reconstructive surgery, particularly regarding the pectoralis major muscle and abdominal donor sites. Traditional subpectoral implant placement requires manipulation of the pectoral musculature, potentially contributing to postoperative discomfort, muscular distortion, and animation deformity during contraction. Prepectoral reconstruction, in contrast, positions the implant above the pectoralis major muscle, preserving its anatomical position and potentially reducing movement-associated deformity.

In a systematic review and meta-analysis involving 3,101 patients, Ostapenko et al. (2023) identified lower odds of capsular contracture and animation deformity following prepectoral reconstruction compared with subpectoral techniques, without statistically significant differences in several other postoperative complications. Nevertheless,

adequate mastectomy flap perfusion, sufficient soft-tissue coverage, and appropriate implant support remain essential considerations. These findings suggest that muscular preservation can offer functional advantages, although technique selection must account for individual anatomical conditions and the limitations of available comparative evidence.

Autologous procedures also require attention to functional outcomes. Abdominal flap harvesting may affect donor-site strength, abdominal wall stability, and postoperative mobility, especially when muscle tissue is included. Consequently, perforator-based approaches have become relevant alternatives for reducing muscular disruption. Functional preservation should therefore be understood as a comprehensive surgical objective encompassing breast reconstruction, donor-site integrity, physical recovery, and postoperative rehabilitation (Kelley et al., 2014; Bennett et al., 2018).

Influence of Radiotherapy on Reconstructive Outcomes

Postmastectomy radiotherapy represents one of the principal challenges in immediate breast reconstruction because radiation-associated tissue changes can compromise vascularity, elasticity, healing capacity, and long-term aesthetic stability. In implant-based procedures, these alterations may contribute to capsular contracture, infection, implant exposure, and reconstructive failure. Autologous reconstruction may offer advantages in selected irradiated patients, although fibrosis, fat necrosis, and volume changes remain potential complications (Schaverien et al., 2013; Zugasti & Hontanilla, 2021).

Recent comparative investigations indicate that reconstructive timing should be individualized according to radiation requirements, surgical characteristics, and expected outcomes. ElAbd et al. (2024) evaluated immediate and delayed autologous reconstruction in patients receiving postmastectomy radiotherapy, highlighting the need to consider both complication profiles and aesthetic results. Similarly, Ren et al. (2024) examined implant-based and autologous approaches in irradiated settings, contributing evidence for selecting reconstructive strategies according to treatment-related risk.

These findings support coordinated preoperative planning between surgical and radiation oncology teams. The possibility of receiving radiotherapy should not automatically exclude immediate reconstruction; rather, it should guide discussions regarding technique selection, anticipated complications, and the potential need for subsequent corrective procedures.

Reconstructive Outcomes and Patient-Reported Quality of Life

The evaluation of reconstructive success has progressively shifted from exclusively anatomical indicators toward multidimensional outcomes encompassing physical comfort, breast satisfaction, psychosocial adaptation, and sexual well-being. The BREAST-Q questionnaire has become an important instrument for assessing these dimensions, allowing reconstructive results to be interpreted from the patient's perspective.

Santosa et al. (2018), in a multicenter investigation involving 2,013 women, reported that autologous reconstruction was associated with greater breast satisfaction, psychosocial well-being, and sexual well-being at two years compared with implant-based reconstruction. The adjusted difference in breast satisfaction was 7.94 points on the BREAST-Q scale, demonstrating that meaningful distinctions between techniques may emerge beyond conventional surgical endpoints. These observations are consistent with the importance of incorporating patient-reported outcomes into reconstructive evaluation (Pusic et al., 2017).

Nevertheless, aesthetic satisfaction does not necessarily correspond to the absence of complications. A technically successful reconstruction may coexist with persistent discomfort, asymmetry, altered sensation, or dissatisfaction with breast appearance. Therefore, comprehensive outcome assessment should include reconstructive durability, postoperative complications, functional recovery, and validated patient-reported measurements.

International Evidence and the Latin American Perspective

Although much of the comparative evidence originates from specialized institutions in North America, Europe, and Asia, Latin American investigations provide valuable information about reconstructive practices in healthcare systems with different resources and organizational characteristics.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Groth et al. (2020) analyzed 268 breast reconstruction cases from a Brazilian public oncology hospital and observed an increase in immediate reconstruction between the periods 2010–2013 and 2014–2017, from 48% to 71%. Tissue expanders represented 66.5% of immediate reconstructive procedures, and no statistically significant differences in immediate or late complications were identified between immediate and delayed reconstruction groups. These findings illustrate the progressive integration of reconstruction into oncological care within a Latin American institutional setting.

Additional contributions from Brazil have examined postoperative satisfaction using BREAST-Q, while investigations from Argentina have addressed anatomical selection and direct-to-implant reconstruction following nipple-sparing mastectomy (de Carvalho Aguiar et al., 2017; Rancati et al., 2017). Collectively, these studies demonstrate the relevance of regional clinical experience, although differences in institutional resources, patient selection, and access to specialized techniques limit direct comparisons across healthcare systems.

OBJETIVO GENERAL Y OBJETIVOS ESPECÍFICOS

General Objective

General Objective

To critically analyze the clinical, oncological, functional, and reconstructive considerations involved in immediate breast reconstruction following breast cancer surgery, comparing surgical techniques and their associated outcomes to establish evidence-based criteria that support individualized decision-making, functional preservation, and long-term patient satisfaction.

Specific Objectives

Cognitive Domain (Understanding, Analyzing, Evaluating)

- To identify the principal indications, contraindications, and clinical factors influencing the selection of immediate breast reconstruction techniques following oncological surgery.
- To compare implant-based and autologous reconstructive procedures regarding surgical complexity, postoperative complications, oncological safety, functional outcomes, and long-term durability.
- To analyze the influence of radiotherapy, patient characteristics, and anatomical conditions on reconstructive outcomes.
- To evaluate international scientific evidence, including Latin American contributions, to recognize similarities, differences, and limitations in reconstructive practices.

Psychomotor Domain (Applying, Organizing, Demonstrating)

- To organize the technical components of immediate breast reconstruction into structured surgical decision pathways that facilitate the understanding of procedural sequencing.
- To illustrate the anatomical principles involved in prepectoral, subpectoral, and autologous reconstruction, emphasizing muscle preservation and donor-site integrity.
- To develop a conceptual framework for evaluating reconstructive feasibility through anatomical assessment, tissue characteristics, and anticipated surgical requirements.

Affective Domain (Valuing, Integrating, Prioritizing)

- To recognize the importance of patient-centered care when evaluating aesthetic expectations, physical functionality, psychosocial well-being, and postoperative quality of life.
- To prioritize oncological safety, informed decision-making, and respect for individual preferences when comparing reconstructive alternatives.
- To promote interdisciplinary collaboration among surgical oncology, plastic surgery, rehabilitation, and supportive care professionals.
- To acknowledge inequalities in access to specialized reconstructive procedures, particularly in Latin American healthcare settings, and their implications for equitable clinical care.

Integration of Bloom's Taxonomy

The objectives are organized according to the progressive acquisition of knowledge, analytical reasoning, applied understanding, and professional values. Cognitive objectives emphasize interpretation and critical evaluation of scientific evidence; psychomotor-oriented objectives focus on the conceptual organization and demonstration of surgical principles through educational models; and affective objectives reinforce ethical reasoning, multidisciplinary

cooperation, and patient-centered decision-making. Together, these domains establish an educational framework for understanding immediate breast reconstruction without requiring direct clinical intervention.

OBJETO DE ESTUDIO

The object of study is immediate breast reconstruction following oncological breast surgery, with particular emphasis on surgical technique selection, functional preservation, oncological safety, and reconstructive outcomes. The analysis focuses on the clinical and anatomical factors that influence reconstructive decision-making, considering implant-based procedures, autologous tissue reconstruction, and contemporary approaches such as prepectoral reconstruction and nipple-sparing mastectomy.

The population of interest comprises adult women undergoing mastectomy for breast cancer who are considered candidates for immediate reconstruction, as represented in previously published clinical studies. Particular attention is given to patients requiring postmastectomy radiotherapy and those presenting anatomical or clinical characteristics that may affect surgical feasibility and postoperative recovery (Bennett et al., 2018; Ren et al., 2024).

The principal dimensions examined include postoperative complications, muscular and anatomical preservation, reconstructive durability, aesthetic outcomes, and patient-reported quality of life. These variables are considered essential for understanding the relationship between surgical decisions and long-term reconstructive success (Santosa et al., 2018).

The study adopts an international perspective while incorporating evidence from Latin American healthcare institutions to identify regional experiences and differences in reconstructive accessibility. Its scope is limited to the critical analysis of published scientific literature, without direct patient recruitment, clinical interventions, or collection of individual medical records. This approach enables an evidence-based examination of immediate breast reconstruction within oncological and multidisciplinary care.

METODOLOGÍA

Study Design

This study was designed as a structured narrative literature review based on the scientific method, using a descriptive, analytical, and comparative approach. The methodological framework was organized around the identification of a clinical problem, formulation of a research question, examination of scientific evidence, critical comparison of findings, and development of evidence-based conclusions. The central research question addressed how immediate breast reconstruction techniques can be selected to optimize oncological safety, functional preservation, postoperative outcomes, and patient satisfaction.

Literature Search Strategy

The bibliographic search was structured around PubMed/MEDLINE and scientific publications indexed in Scopus, prioritizing peer-reviewed studies related to immediate breast reconstruction following oncological surgery. Search terms included “immediate breast reconstruction,” “mastectomy,” “implant-based reconstruction,” “autologous breast reconstruction,” “prepectoral reconstruction,” “functional outcomes,” “postmastectomy radiotherapy,” and “BREAST-Q.” These terms were combined using the Boolean operators AND and OR to identify studies addressing surgical techniques, clinical complications, functional preservation, and patient-reported outcomes.

The selected evidence comprised 20 scientific publications dated between 2010 and 2024. Studies published in English, Spanish, and Portuguese were considered to facilitate the inclusion of international evidence and contributions from Latin American institutions.

Eligibility and Selection Criteria

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Eligible publications included observational studies, comparative clinical investigations, multicenter cohorts, systematic reviews, and meta-analyses involving adult women undergoing breast reconstruction following mastectomy for breast cancer. Priority was given to studies evaluating immediate reconstruction, surgical technique selection, postoperative complications, radiotherapy-related outcomes, functional preservation, and quality of life.

Studies focusing exclusively on unrelated reconstructive procedures, isolated case reports without broader comparative relevance, and publications lacking sufficient methodological or clinical information were excluded. Investigations comparing immediate and delayed reconstruction were retained when their findings contributed directly to the research objectives.

Data Extraction and Critical Appraisal

The selected publications were examined according to authorship, publication year, geographical origin, study design, reconstructive technique, clinical characteristics, and reported outcomes. Particular attention was given to postoperative complications, reconstructive failure, anatomical preservation, radiotherapy exposure, aesthetic outcomes, and patient satisfaction measured through validated instruments.

Evidence was critically interpreted by considering sample characteristics, methodological limitations, follow-up duration, potential confounding factors, and differences between reconstructive procedures. Studies from Latin America were incorporated to contextualize international findings within regional healthcare conditions and institutional experiences (Groth et al., 2020; Rancati et al., 2017).

Evidence Synthesis

Findings were organized into thematic categories addressing oncological considerations, surgical technique selection, functional preservation, radiotherapy, postoperative complications, and patient-reported outcomes. A qualitative comparative synthesis was performed to identify areas of agreement, conflicting findings, and limitations in the available evidence.

Because of heterogeneity in study designs, surgical techniques, outcome definitions, and follow-up periods, no new quantitative meta-analysis was undertaken. Previously published statistical results were interpreted within their original methodological contexts, without combining patient-level data or generating independent clinical estimates.

The review used previously published scientific information exclusively. No patients were recruited, no clinical interventions were performed, and no identifiable medical records were accessed. This methodological approach supports a reproducible conceptual framework for critically examining immediate breast reconstruction while acknowledging the limitations inherent to narrative evidence synthesis.

FASES DEL DESARROLLO

Identification and Delimitation of the Research Problem

The initial phase focused on identifying the clinical challenges associated with immediate breast reconstruction following oncological surgery. Particular attention was directed toward the variability in surgical techniques, differences in postoperative complications, preservation of anatomical structures, and the influence of adjuvant cancer treatments. Previous investigations have demonstrated that reconstructive success depends not only on surgical feasibility but also on long-term functional outcomes and patient satisfaction (Bennett et al., 2018; Santosa et al., 2018).

The research problem was therefore delimited to the comparative evaluation of reconstructive alternatives and the identification of factors supporting individualized surgical decision-making.

Formulation of the Research Question and Working Hypothesis

The guiding research question examined which clinical, anatomical, and oncological factors should influence the selection of immediate breast reconstruction techniques to achieve favorable functional and reconstructive outcomes.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

The review was guided by the proposition that individualized reconstructive planning, incorporating tumor characteristics, anatomical conditions, anticipated radiotherapy, and patient preferences, provides a more comprehensive basis for decision-making than the routine preference for a single surgical technique. This proposition was examined through published evidence rather than experimental hypothesis testing (Pusic et al., 2017; Ren et al., 2024).

Identification and Selection of Scientific Evidence

The bibliographic phase involved organizing the selected scientific literature according to its relevance to immediate breast reconstruction. The review considered 20 publications from 2010 to 2024, encompassing comparative studies, multicenter investigations, systematic reviews, and meta-analyses.

The evidence was classified into thematic categories addressing oncological safety, implant-based reconstruction, autologous techniques, muscular preservation, radiotherapy-related complications, and patient-reported outcomes. Studies from Latin American institutions were included to incorporate regional perspectives and differences in reconstructive practices (Rancati et al., 2017; Groth et al., 2020).

Comparative Analysis and Critical Interpretation

The analytical phase examined the benefits and limitations of reconstructive approaches using consistent clinical dimensions, including postoperative morbidity, reconstructive failure, functional preservation, and patient satisfaction.

Implant-based techniques were evaluated in relation to surgical complexity, capsular contracture, and reconstructive durability, whereas autologous procedures were examined regarding tissue integration, donor-site morbidity, and long-term outcomes. Special attention was given to prepectoral reconstruction because of its potential advantages in preserving pectoral muscle integrity (Basta et al., 2015; Ostapenko et al., 2023).

The influence of radiotherapy was examined separately because it can substantially modify surgical outcomes and complicate comparisons between techniques. Differences in study design, follow-up duration, and outcome definitions were considered when interpreting the findings (Schaverien et al., 2013; ElAbd et al., 2024).

Integration and Synthesis of Findings

The final analytical phase integrated the available evidence into a clinical interpretation framework organized around oncological eligibility, anatomical characteristics, functional preservation, treatment-related risks, and reconstructive expectations.

Particular emphasis was placed on differentiating surgical complications from patient-perceived success, recognizing that aesthetic satisfaction and quality of life represent outcomes that cannot be adequately described through complication rates alone (Pusic et al., 2017; Santosa et al., 2018).

The synthesis also considered limitations associated with heterogeneous study populations, variation in surgical expertise, and unequal access to specialized reconstructive services across healthcare systems.

Development of Conclusions and Educational Implications

The concluding phase was directed toward identifying the main principles supporting evidence-informed reconstructive selection. The review sought to establish clinically relevant considerations for comparing implant-based and autologous approaches, anticipating treatment-related complications, and incorporating functional and patient-reported outcomes into surgical planning.

The findings were organized to support undergraduate and postgraduate medical education, emphasizing critical interpretation of scientific literature, multidisciplinary collaboration, and individualized reconstructive decision-making. The resulting framework is intended as an educational synthesis rather than a validated clinical prediction model or a substitute for specialist assessment.

Edición 5, Año 3, Número 2, 2026

E-ISSN: 3061-8045, P-ISSN: 3061-8517

Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026

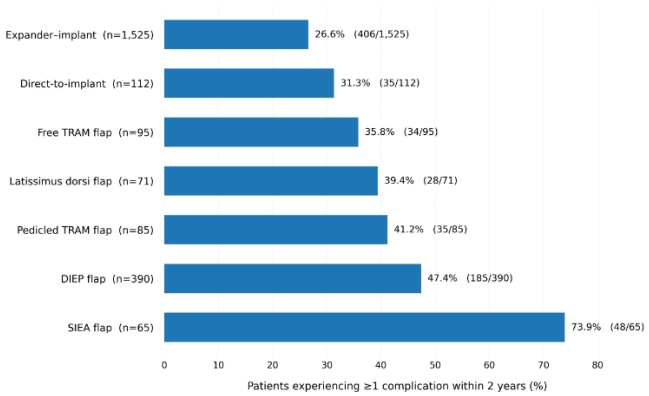
E-ISSN: 3061-8045, P-ISSN: 3061-8517

IECCMEXICO Review

RESULTADOS Y DISCUSIÓN

Figure 1.

Comparative Postoperative Complication Rates Across Breast Reconstruction Techniques



The comparative analysis of postoperative complications demonstrated substantial variability among breast reconstruction techniques during the two-year follow-up period. Data obtained from the multicenter investigation conducted by Bennett et al. (2018), involving 2,343 patients, revealed an overall complication rate of 32.9%, corresponding to 771 individuals who experienced at least one postoperative complication. The distribution of complications differed significantly across reconstructive procedures ($p < .001$), indicating considerable heterogeneity in the observed surgical outcomes.

Among implant-based procedures, two-stage expander–implant reconstruction exhibited the lowest overall complication rate, at 26.6% (406 of 1,525 patients), whereas direct-to-implant reconstruction demonstrated a rate of 31.3% (35 of 112 patients). Although the absolute difference between these approaches was relatively modest, their complication profiles must be considered in relation to the distinct surgical characteristics of each procedure. In the adjusted analysis, the difference between direct-to-implant and expander–implant reconstruction was not statistically significant (OR = 1.08; 95% CI: 0.65–1.77; $p = .78$), suggesting that the observed difference in crude percentages did not establish a statistically supported difference in overall complication risk (Bennett et al., 2018).

Autologous reconstruction presented greater variability. Free transverse rectus abdominis myocutaneous (TRAM) flap reconstruction exhibited a complication rate of 35.8%, followed by latissimus dorsi flap reconstruction at 39.4% and pedicled TRAM flap reconstruction at 41.2%. Deep inferior epigastric perforator (DIEP) flap reconstruction demonstrated a higher frequency of postoperative complications, reaching 47.4% among 390 patients. Nevertheless, these percentages represent overall postoperative morbidity and do not distinguish between minor complications, complications requiring additional surgery, and definitive reconstructive failure.

The highest complication frequency was observed in reconstructions using superficial inferior epigastric artery (SIEA) flaps, with a reported rate of 73.9%. This subgroup included 65 patients, substantially fewer than the expander–implant and DIEP groups. The smaller sample size is relevant when interpreting the stability of this estimate. In the multivariable analysis, SIEA reconstruction was associated with significantly greater odds of experiencing any complication compared with expander–implant reconstruction (OR = 4.71; 95% CI: 2.32–9.54; $p < .001$). Similarly, DIEP reconstruction demonstrated increased adjusted odds of overall complications (OR = 1.97; 95% CI: 1.41–2.76; $p < .001$) (Bennett et al., 2018).

An additional finding concerns the distinction between postoperative complications and reconstructive failure. Despite the comparatively lower overall complication rates observed in implant-based procedures, both direct-to-implant and expander–implant reconstruction presented reconstructive failure rates of 7.1%. In contrast, failure rates were 1.3% for DIEP flaps, 1.2% for pedicled TRAM flaps, and 2.1% for free TRAM flaps. These results demonstrate that the frequency of any postoperative complication and the probability of losing the reconstruction represent different clinical outcomes and should be reported separately (Bennett et al., 2018).

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

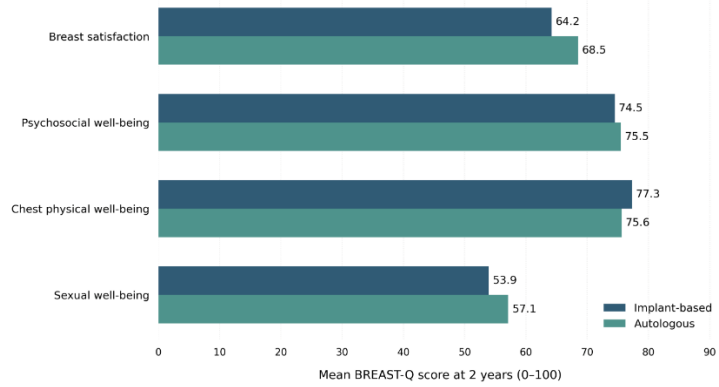
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

The study also identified differences in complications requiring reoperation. Reoperative complications occurred in 19.3% of the overall population, with rates of 15.5% for expander–implant reconstruction, 18.8% for direct-to-implant reconstruction, 29.2% for DIEP flaps, and 30.8% for SIEA flaps. These findings provide an additional measure of postoperative morbidity, although differences in surgical complexity, baseline characteristics, and reconstructive timing may influence comparisons between groups.

Importantly, the study population was not restricted exclusively to immediate breast reconstruction. Most procedures were immediate, but a smaller proportion involved delayed reconstruction. The reported percentages are therefore descriptive results from a predominantly immediate-reconstruction cohort rather than isolated complication estimates for immediate procedures alone. Furthermore, the observational design and differences in patient characteristics limit causal interpretation of the comparisons.

Figure 2.

Patient-Reported Satisfaction and Quality-of-Life Outcomes Following Implant-Based and Autologous Reconstruction



The evaluation of patient-reported outcomes demonstrated differences between implant-based and autologous breast reconstruction across the principal domains of the BREAST-Q questionnaire. Data from the multicenter prospective study conducted by Santosa et al. (2018), involving 2,013 women undergoing immediate breast reconstruction, revealed variations in breast satisfaction, psychosocial well-being, physical well-being of the chest, and sexual well-being during the two-year postoperative assessment. Of the original study population, 1,490 women underwent implant-based reconstruction and 523 received autologous reconstruction. At two years, 1,217 participants completed the patient-reported outcome questionnaires.

Breast satisfaction showed one of the most notable differences between reconstructive approaches. Patients undergoing autologous reconstruction reported a mean score of 68.5 points, compared with 64.2 points among patients receiving implant-based reconstruction, representing an unadjusted difference of 4.3 points. The longitudinal evaluation also revealed differences in the direction of change from baseline. The autologous group increased from 58.2 points before surgery to 68.5 points at two years, whereas the implant-based group remained comparatively stable, changing from 64.0 to 64.2 points. These findings document distinct trajectories of breast satisfaction following the two reconstructive approaches (Santosa et al., 2018).

Psychosocial well-being demonstrated relatively high scores in both reconstructive groups. Patients receiving autologous reconstruction reported a mean score of 75.5 points, compared with 74.5 points among those undergoing implant-based reconstruction. Although the unadjusted difference at two years was limited to 1.0 point, both groups showed postoperative improvement relative to baseline, particularly the autologous group, which increased from 68.0 to 75.5 points. The implant-based group increased from 71.9 to 74.5 points during the same period.

Physical well-being of the chest presented a different distribution. Implant-based reconstruction was associated with an unadjusted mean score of 77.3 points, compared with 75.6 points following autologous reconstruction. Both groups

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

reported lower mean scores than their respective preoperative baselines, which were 80.3 and 76.8 points. These findings demonstrate that physical well-being and satisfaction with breast appearance do not necessarily follow identical postoperative patterns (Santosa et al., 2018).

Sexual well-being also differed between reconstructive techniques. Patients undergoing autologous reconstruction reported a mean score of 57.1 points, compared with 53.9 points in the implant-based group, corresponding to an unadjusted difference of 3.2 points. The autologous group showed an increase from its preoperative mean of 53.5 points, whereas the implant-based group demonstrated a decrease from 58.8 points before surgery. These differences indicate that sexual well-being should be assessed independently from breast satisfaction and physical recovery.

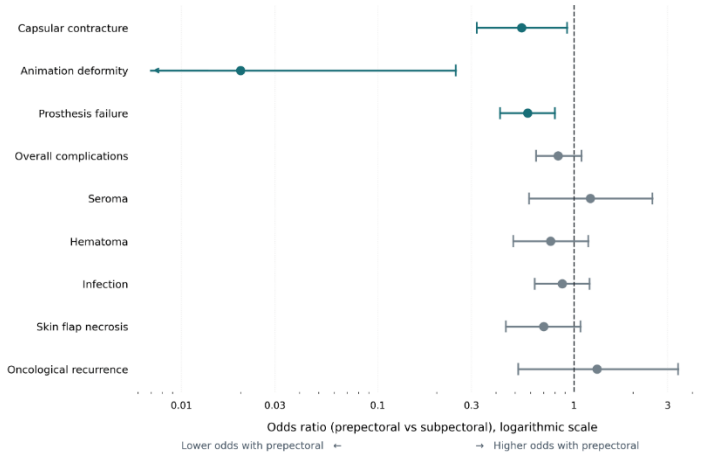
The multivariable analysis provided an additional perspective by accounting for baseline characteristics and other relevant factors. Compared with implant-based reconstruction, autologous reconstruction was associated with significantly greater breast satisfaction, with an adjusted mean difference of 7.94 points (95% CI: 5.68–10.20; $p < .001$). The corresponding adjusted differences were 3.27 points for psychosocial well-being (95% CI: 1.25–5.29; $p = .002$), 1.69 points for physical well-being of the chest (95% CI: 0.13–3.24; $p = .03$), and 5.53 points for sexual well-being (95% CI: 2.95–8.11; $p < .001$). Therefore, although the unadjusted chest physical well-being score was slightly higher in the implant-based group, the adjusted analysis favored autologous reconstruction (Santosa et al., 2018).

An additional outcome involved physical well-being at the abdominal donor site. Among women undergoing autologous reconstruction, abdominal well-being scores declined from a preoperative mean of 87.4 points to 76.3 points at two years. This dimension was not assessed in the implant-based group because abdominal tissue harvesting was not part of those procedures. Consequently, donor-site outcomes could not be directly compared between reconstructive groups using this measure.

Interpretation of these findings requires consideration of the study's observational design and follow-up characteristics. The BREAST-Q results reflect the experiences of women who completed their intended reconstruction, and the analysis excluded patients who experienced reconstructive failure or changed reconstructive techniques. Additionally, differences in baseline characteristics, treatment exposure, and questionnaire completion may influence the observed scores. The figure presents unadjusted means rather than risk-adjusted estimates; the adjusted differences reported in the text were obtained from the study's regression analysis.

Figure 3.

Comparative Outcomes of Prepectoral and Subpectoral Breast Reconstruction



Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

The comparative evaluation of prepectoral and subpectoral implant-based breast reconstruction demonstrated significant differences in specific postoperative outcomes, particularly capsular contracture, animation deformity, and prosthesis failure. The systematic review and meta-analysis conducted by Ostapenko et al. (2023), which incorporated 15 studies involving 3,101 patients, identified differences associated with implant placement relative to the pectoralis major muscle.

Capsular contracture was significantly less frequent following prepectoral reconstruction, with a pooled odds ratio of 0.54 (95% CI: 0.32–0.92; p = .02). This finding corresponds to approximately 46% lower odds of capsular contracture compared with subpectoral placement. The confidence interval remained below the null value of 1.0, supporting a statistically significant difference between reconstructive approaches. However, this estimate represents a relative association rather than an absolute reduction in complication probability, and its interpretation should account for variation in surgical technique, implant characteristics, and follow-up periods (Ostapenko et al., 2023).

The most pronounced difference involved animation deformity, characterized by visible displacement or distortion of the reconstructed breast during contraction of the pectoralis major muscle. Prepectoral reconstruction demonstrated substantially lower odds of this complication (OR = 0.02; 95% CI: 0.00–0.25; p = .002). The magnitude of this association was considerably greater than that observed for the other outcomes included in the analysis. The wide confidence interval, particularly near its lower boundary, nevertheless reflects uncertainty concerning the precise magnitude of the effect.

Prosthesis failure also differed significantly between surgical approaches. Prepectoral reconstruction was associated with lower odds of failure (OR = 0.58; 95% CI: 0.42–0.80; p = .001), corresponding to approximately 42% lower odds compared with subpectoral reconstruction. This outcome provides information distinct from overall postoperative morbidity because prosthesis failure represents a more specific reconstructive endpoint.

In contrast, the analysis did not demonstrate a statistically significant difference in overall complications between prepectoral and subpectoral techniques (OR = 0.83; 95% CI: 0.64–1.09; p = .19). Although the point estimate was below 1.0, the confidence interval crossed the null value, indicating that the available evidence did not establish a definitive difference in the overall probability of postoperative complications (Ostapenko et al., 2023).

Similarly, no statistically significant differences were identified for seroma formation (OR = 1.21; 95% CI: 0.59–2.51; p = .60), hematoma (OR = 0.76; 95% CI: 0.49–1.18; p = .22), or postoperative infection (OR = 0.87; 95% CI: 0.63–1.20; p = .39). The confidence intervals for these outcomes included values compatible with either an increase or a reduction in complication odds. Consequently, their observed point estimates should not be interpreted as evidence of equivalence between procedures.

Skin flap necrosis showed a similar pattern, with a pooled odds ratio of 0.70 (95% CI: 0.45–1.08; p = .11). Despite a point estimate favoring prepectoral reconstruction, the association was not statistically significant. This finding is particularly relevant because skin flap viability represents an important outcome in implant-based reconstruction, and its evaluation may be influenced by patient selection and differences in mastectomy flap characteristics.

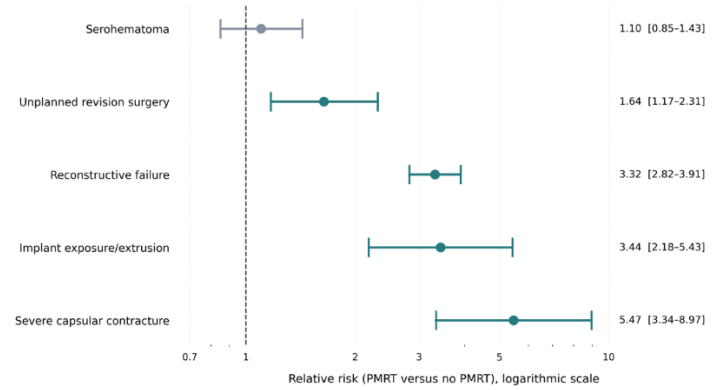
Regarding oncological outcomes, the pooled estimate for recurrence was 1.31 (95% CI: 0.52–3.39; p = .55). The relatively wide confidence interval indicated considerable uncertainty, and no statistically significant difference was identified between the reconstructive planes. These data describe the absence of a detected difference within the available evidence rather than demonstrating definitive oncological equivalence.

Patient-reported outcomes were also evaluated in the underlying meta-analysis. No statistically significant differences were identified in BREAST-Q scores between prepectoral and subpectoral reconstruction groups. Thus, the differences observed in selected surgical complications were not accompanied by a clearly established difference in the patient-reported outcomes available for analysis (Ostapenko et al., 2023).

An important methodological consideration is that the pooled estimates were obtained from studies with varying clinical characteristics, reconstructive protocols, and follow-up durations. Consequently, the nine outcomes displayed in Figure 3 do not necessarily represent identical patient populations or identical observation periods. Furthermore, the evidence was predominantly observational, making the estimates susceptible to confounding and selection bias.

Figure 4.

Influence of Postmastectomy Radiotherapy on Reconstructive Complications and Outcomes



The comparative analysis demonstrated substantial differences in postoperative complications between irradiated and nonirradiated breasts following immediate implant-based reconstruction. The systematic review and meta-analysis conducted by Zugasti and Hontanilla (2021) included 14 studies encompassing 11,958 reconstructions, with 2,311 procedures exposed to postmastectomy radiotherapy and 9,647 belonging to the nonirradiated control group. The pooled findings identified increased risks of several reconstructive complications associated with radiotherapy, although the magnitude of association varied according to the specific outcome evaluated.

The most pronounced association was observed for severe capsular contracture, defined as Baker grade III or IV. Patients exposed to radiotherapy demonstrated a pooled relative risk of 5.47 (95% CI: 3.34–8.97), indicating more than five times the risk observed in nonirradiated reconstructions. The reported incidence was 24.31% among irradiated breasts, compared with 4.42% in the control group. The confidence interval remained entirely above the null value, supporting a statistically significant association between radiotherapy exposure and severe capsular contracture. Moderate heterogeneity was identified for this outcome ($I^2 = 53\%$), reflecting variation among the contributing studies (Zugasti & Hontanilla, 2021).

Implant exposure or extrusion also demonstrated a significant association with radiotherapy. The pooled relative risk was 3.44 (95% CI: 2.18–5.43), with reported incidence rates of 5.95% among irradiated reconstructions and 2.01% among nonirradiated reconstructions. These findings indicate a higher frequency of prosthetic exposure or extrusion following radiation treatment. The estimate was derived from five studies evaluating this outcome, with relatively limited heterogeneity ($I^2 = 28\%$). Accordingly, the observed association was consistent across the available comparative evidence, although differences in patient characteristics and reconstructive protocols remained relevant.

Reconstructive failure represented another clinically important outcome. Postmastectomy radiotherapy was associated with a pooled relative risk of 3.32 (95% CI: 2.82–3.91), indicating a substantially higher risk of reconstruction loss or failure compared with nonirradiated procedures. Within the original analysis, reconstructive failure included loss of reconstruction, implant loss, or conversion to an autologous reconstructive approach. The pooled estimate demonstrated a relatively narrow confidence interval, while heterogeneity was reported at 28%. These findings establish a statistically significant association between radiation exposure and reconstructive failure in the included implant-based reconstruction studies (Zugasti & Hontanilla, 2021).

Unplanned revision surgery was also more frequent among irradiated patients. The pooled relative risk was 1.64 (95% CI: 1.17–2.31), with reported reoperation rates of 34.72% in the irradiated group and 10.70% among nonirradiated controls. The confidence interval excluded 1.0, supporting statistical significance. However, the pooled relative risk should be distinguished from a ratio calculated directly from the displayed percentages, because meta-analytic estimates incorporate study-level weighting and may not correspond to the simple ratio of aggregated incidence values.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

In contrast, serohematoma did not demonstrate a statistically significant difference between irradiated and nonirradiated procedures. The pooled relative risk was 1.10 (95% CI: 0.85–1.43), and the confidence interval crossed the null value. Heterogeneity was relatively low ($I^2 = 17\%$). Although the point estimate indicated slightly higher risk among irradiated reconstructions, the available evidence did not establish a statistically significant association for this particular complication.

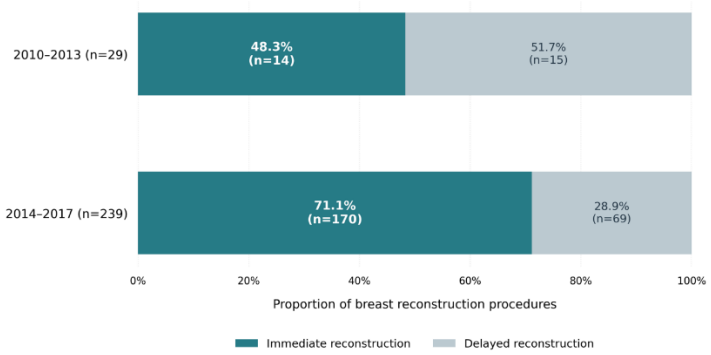
Additional evidence from Ren et al. (2024) compared immediate implant-based reconstruction with autologous reconstruction among patients receiving postmastectomy radiotherapy. Their meta-analysis included eight studies involving 1,261 patients and demonstrated a significantly greater risk of reconstructive failure with implant-based techniques (RR = 8.61; 95% CI: 2.84–26.08; p = .0001). In contrast, differences in complications requiring reoperation did not reach statistical significance. These results were obtained from a separate comparison and are therefore not incorporated into the plotted pooled estimates.

The influence of radiotherapy has also been investigated in autologous reconstruction. ElAbd et al. (2024) analyzed 13 comparative studies including 565 patients who underwent immediate autologous reconstruction followed by radiotherapy and 699 who underwent delayed reconstruction. Immediate reconstruction was associated with greater odds of flap fibrosis (OR = 28.18; 95% CI: 5.15–154.12) and skin flap necrosis (OR = 6.12; 95% CI: 2.71–13.82), while several other postoperative complications did not differ significantly between groups. These findings describe a distinct comparison involving reconstructive timing and should not be directly combined with estimates obtained from implant-based procedures.

An important methodological consideration is that the outcomes displayed in Figure 4 were derived from different subsets of studies within the same systematic review. Consequently, their pooled estimates do not necessarily represent identical populations, follow-up periods, or reconstructive protocols. Furthermore, variation in radiotherapy timing, implant placement, reconstruction stage, and clinical risk factors may contribute to differences in reported complications.

Figure 5.

Trends in Immediate Breast Reconstruction Within a Latin American Oncology Institution



The analysis of reconstructive practices in a Latin American oncology institution demonstrated a significant change in the distribution of immediate and delayed breast reconstruction procedures between 2010 and 2017. The retrospective observational study conducted by Groth et al. (2020) at Erasto Gaertner Hospital in Curitiba, Brazil, included 268 women who underwent breast reconstruction following mastectomy. Patients were divided into two chronological groups: 29 women treated between 2010 and 2013 and 239 women treated between 2014 and 2017.

During the first observation period, immediate reconstruction represented 48.3% of procedures, corresponding to 14 of 29 patients. Delayed reconstruction accounted for the remaining 51.7%, involving 15 patients. In contrast, the second period showed a greater proportion of immediate procedures, reaching 71.1%, corresponding to 170 of 239 patients.

Delayed reconstruction declined proportionally to 28.9%, involving 69 patients. The difference between the two periods was statistically significant (p = .013), as reported by Groth et al. (2020).

The absolute increase in the proportion of immediate reconstruction was approximately 22.8 percentage points. When expressed as a relative change in the proportion of procedures, this represented an increase of approximately 47.3% compared with the first period. The numerical distribution also demonstrated an increase in the total number of reconstructed patients recorded during the second period, although the two groups differed substantially in sample size. Consequently, the observed changes reflect both the relative distribution of surgical timing and the number of reconstruction cases included in each chronological interval.

The original investigation identified tissue expander-based reconstruction as the predominant technique among women undergoing immediate reconstruction. Alloplastic reconstruction using expanders accounted for 66.5% of immediate procedures. Autologous techniques were more commonly represented among delayed reconstructions. These findings describe differences in the distribution of reconstructive techniques according to surgical timing within the institution (Groth et al., 2020).

Postoperative complications were also evaluated in the same population. Among women undergoing immediate reconstruction, early complications occurred in 10.19% of cases, while late complications were documented in 8.9%. In patients receiving delayed reconstruction, the corresponding rates were 14.06% and 9.37%, respectively. No statistically significant difference was identified between immediate and delayed reconstruction regarding the occurrence of early or late complications. Surgical wound dehiscence was the most frequently reported early complication among immediately reconstructed patients.

Radiotherapy exposure was examined as an additional clinical variable. The reported overall complication rate was 29.16% among patients receiving radiotherapy, compared with 20.35% among those who did not receive radiation treatment. Nevertheless, this difference was not statistically significant (p = .28). Among irradiated patients, complication rates were 27.02% following immediate reconstruction and 31.4% following delayed reconstruction, without a statistically significant difference between groups (p = .76). These findings were obtained from the same institutional cohort and should be interpreted according to its sample size and observational characteristics (Groth et al., 2020).

The investigation additionally compared reconstructive complications according to the surgical technique used in irradiated patients. Alloplastic reconstruction was associated with a complication rate of 32.65%, compared with 21.7% following autologous reconstruction. However, the difference was not statistically significant (p = .47), indicating that the study did not establish a definitive difference in complication frequency between these reconstructive approaches within the radiotherapy subgroup.

Neoadjuvant chemotherapy constituted another variable examined in the original study. Among patients undergoing immediate reconstruction, complications were observed in 25% of those who received neoadjuvant chemotherapy, compared with 18.11% of those who did not. This difference was not statistically significant (p = .3811). The findings therefore describe numerical variation in complication rates without demonstrating a statistically supported association between neoadjuvant chemotherapy and postoperative morbidity in the analyzed population.

An important methodological consideration concerns the unequal sample sizes across the two chronological groups. The first period included only 29 patients, whereas the second comprised 239. This difference affects the precision of the respective percentage estimates and limits comparisons based exclusively on absolute numbers. Furthermore, the study was conducted at a single public oncology institution, and its findings represent local clinical experience rather than population-based estimates of breast reconstruction utilization throughout Brazil or Latin America.

The chronological division also coincided with the implementation of Brazilian Law No. 12,802/2013, which established provisions concerning immediate breast reconstruction within the public healthcare system when clinically appropriate. Although the institutional change occurred during this broader regulatory period, the observational study design does not establish that legislation independently caused the increase in immediate reconstruction. Other institutional, surgical, and patient-related factors were not isolated through causal analysis.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

DISCUSIÓN

The findings of this review demonstrate that immediate breast reconstruction following oncological surgery involves a complex interaction between surgical technique, oncological requirements, anatomical preservation, postoperative complications, and patient-reported outcomes. The comparative evidence presented across the five figures indicates that no single reconstructive approach consistently achieves superior results in every clinical dimension. Instead, the available literature supports a multidimensional interpretation of reconstructive success, in which surgical morbidity, long-term durability, functional outcomes, and quality of life represent complementary but distinct measures of treatment effectiveness (Bennett et al., 2018; Santosa et al., 2018).

One of the most relevant findings concerns the differences in postoperative complications between implant-based and autologous reconstruction. Bennett et al. (2018) reported considerable variation in overall complication rates, with lower frequencies following expander–implant reconstruction and higher rates among certain autologous procedures, particularly superficial inferior epigastric artery flaps. However, implant-based reconstruction demonstrated greater rates of reconstructive failure than several autologous techniques. This distinction is important because the occurrence of a postoperative complication does not necessarily indicate definitive reconstructive loss. Similarly, a procedure associated with relatively low initial morbidity may require additional interventions during subsequent follow-up. These observations are consistent with the findings of Basta et al. (2015), who identified differences in complication profiles between direct-to-implant and conventional two-stage reconstruction, emphasizing the relevance of considering procedural characteristics rather than evaluating complication frequency in isolation.

The relationship between surgical complexity and reconstructive outcomes becomes particularly relevant when comparing autologous and implant-based techniques. Autologous reconstruction involves additional operative demands, donor-site morbidity, and potential vascular complications. Nevertheless, it may provide greater reconstructive stability and favorable long-term patient-reported outcomes. Santosa et al. (2018) demonstrated that women undergoing autologous reconstruction reported higher adjusted breast satisfaction, psychosocial well-being, and sexual well-being at two years compared with those receiving implants. These differences suggest that reconstructive evaluation should extend beyond immediate postoperative recovery to encompass the patient's experience over time. However, the observational nature of the available evidence limits causal conclusions, particularly because anatomical suitability, patient preferences, and clinical indications influence the selection of reconstructive procedures.

Functional preservation emerged as another central consideration. The comparison between prepectoral and subpectoral reconstruction demonstrated significantly lower odds of animation deformity, capsular contracture, and prosthesis failure with prepectoral placement (Ostapenko et al., 2023). These findings are particularly relevant because subpectoral reconstruction involves manipulation of the pectoralis major muscle, potentially affecting movement-associated breast contour and postoperative comfort. Nevertheless, the absence of statistically significant differences in several other complications indicates that the advantages of prepectoral placement should not be generalized to every outcome. Adequate soft-tissue coverage, tissue perfusion, and anatomical suitability remain fundamental considerations. Furthermore, the available evidence does not establish that preserving the pectoralis major muscle necessarily produces superior objective measurements of muscular strength or shoulder function, since these outcomes were not consistently evaluated in the included studies.

The influence of postmastectomy radiotherapy constitutes one of the most important factors affecting reconstructive outcomes. The findings summarized from Zugasti and Hontanilla (2021) demonstrated substantially increased risks of severe capsular contracture, implant exposure, reconstructive failure, and unplanned revision surgery among irradiated patients undergoing immediate implant-based reconstruction. These observations are consistent with the recognized effects of radiation on tissue vascularity, fibrosis, and wound healing. However, the magnitude of these associations should be interpreted cautiously because radiotherapy protocols, reconstructive timing, implant characteristics, and patient selection differed across the included investigations.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Comparative evidence involving autologous reconstruction introduces additional complexity. Ren et al. (2024) reported a higher risk of reconstructive failure with implant-based approaches than with autologous reconstruction in patients receiving postmastectomy radiotherapy. Nevertheless, ElAbd et al. (2024) identified increased risks of flap fibrosis and skin flap necrosis when immediate autologous reconstruction was compared with delayed reconstruction in irradiated settings. These findings are not necessarily contradictory, as the investigations evaluated different surgical comparisons and clinical endpoints. Rather, they demonstrate that the influence of radiotherapy depends on the reconstructive technique, timing of surgery, and outcome being measured. Consequently, decisions concerning immediate reconstruction in patients requiring radiotherapy should integrate oncological planning with an individualized assessment of reconstructive risks.

Oncological safety remains a prerequisite for selecting reconstructive procedures. Studies evaluating nipple-sparing mastectomy have reported acceptable oncological outcomes in appropriately selected populations, supporting its use when anatomical and tumor-related criteria are satisfied (Headon et al., 2016; Yamashita et al., 2021). Nevertheless, reconstructive benefits must not compromise adequate oncological resection, margin assessment, or the delivery of necessary adjuvant treatment. The selection criteria described by Rancati et al. (2017) further emphasize the role of preoperative imaging and anatomical assessment when considering direct-to-implant reconstruction following nipple-sparing mastectomy. Taken together, these investigations support coordinated surgical planning in which oncological requirements determine reconstructive feasibility rather than being modified to accommodate a preferred reconstructive technique.

Another important finding concerns the distinction between objectively measured surgical outcomes and patient-reported satisfaction. The BREAST-Q results presented in Figure 2 demonstrate that favorable aesthetic and psychosocial outcomes do not necessarily correspond to the lowest complication rates. Autologous reconstruction was associated with higher adjusted satisfaction scores in several domains despite greater overall postoperative morbidity in some comparative cohorts (Bennett et al., 2018; Santosa et al., 2018). This apparent discrepancy highlights the importance of recognizing reconstructive success as a multidimensional concept. Physical comfort, breast appearance, sexual well-being, donor-site symptoms, and the durability of reconstruction may contribute differently to the patient's overall assessment. Therefore, combining validated patient-reported instruments with conventional clinical endpoints provides a more comprehensive evaluation of reconstructive outcomes.

The Latin American evidence included in this review offers an additional perspective on reconstructive practices. Groth et al. (2020) documented an increase in immediate reconstruction within a Brazilian public oncology institution, accompanied by the predominance of tissue expander-based procedures. These findings illustrate changes in reconstructive practice within a specific healthcare setting, although they cannot establish broader national or regional trends. Similarly, Brazilian research involving BREAST-Q and Argentine investigations addressing anatomical selection provide contributions to understanding reconstructive outcomes outside the healthcare systems most frequently represented in international multicenter studies (de Carvalho Aguiar et al., 2017; Rancati et al., 2017). The limited number of Latin American studies in the selected literature also highlights the need for additional multicenter investigations capable of evaluating outcomes across different institutional resources and patient populations.

Several methodological limitations must be acknowledged. First, the included publications differed in study design, sample size, reconstructive techniques, follow-up duration, and definitions of complications. Such heterogeneity limits direct comparisons between findings derived from separate investigations. Second, many of the available studies were observational, introducing potential confounding related to patient characteristics, comorbidities, surgical expertise, and treatment selection. Third, outcomes such as functional preservation, aesthetic satisfaction, and reconstructive durability were not measured uniformly. In particular, objective measurements of muscular performance and long-term donor-site function were less consistently available than conventional complication rates.

An additional limitation concerns the narrative design of the present review. Although the literature was organized according to predefined clinical dimensions, the absence of a formal systematic screening process and standardized risk-of-bias assessment prevents definitive conclusions regarding the comparative superiority of reconstructive procedures. Furthermore, published findings may reflect differences in healthcare resources, institutional experience, and reconstructive protocols that are not fully captured by aggregated clinical outcomes.

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO

Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

Future research should prioritize prospective multicenter investigations with standardized definitions of postoperative complications, reconstructive failure, and functional outcomes. Longer follow-up periods would also improve the evaluation of implant-related complications, autologous tissue changes, and the durability of patient-reported satisfaction. Particular attention should be directed toward objective assessment of pectoralis major function, shoulder mobility, abdominal donor-site morbidity, and postoperative rehabilitation. In addition, studies from Latin America should examine reconstructive accessibility, treatment continuity, institutional resources, and validated quality-of-life outcomes to strengthen the applicability of international evidence across different healthcare environments.

CONCLUSIÓN

Immediate breast reconstruction following oncological surgery represents an essential component of comprehensive breast cancer management, requiring an individualized balance between oncological safety, surgical feasibility, functional preservation, and long-term reconstructive outcomes. The evidence examined in this review demonstrates that no single reconstructive technique consistently provides superior results across all clinical dimensions. Implant-based and autologous procedures present distinct complication profiles, reconstructive durability, and patient-reported outcomes, emphasizing the importance of selecting surgical strategies according to individual anatomical characteristics, treatment requirements, and patient preferences.

The comparative findings indicate that implant-based reconstruction may offer advantages in terms of operative complexity and certain postoperative complication rates, whereas autologous techniques can provide favorable long-term satisfaction and lower rates of reconstructive failure in selected populations. Furthermore, prepectoral implant placement has demonstrated benefits regarding animation deformity, capsular contracture, and preservation of the pectoralis major muscle. Nevertheless, these advantages must be evaluated alongside tissue viability, anatomical suitability, and the limitations of the available comparative evidence.

Postmastectomy radiotherapy remains a determining factor in reconstructive planning because of its association with capsular contracture, prosthetic complications, and reconstructive failure. Its effects vary according to surgical technique and reconstructive timing, reinforcing the need for coordinated decision-making between surgical oncology, plastic surgery, and radiation oncology specialists. Similarly, patient-reported outcomes demonstrate that reconstructive success cannot be defined exclusively by the absence of complications, but must also incorporate physical well-being, breast satisfaction, psychosocial adaptation, and sexual well-being.

The incorporation of Latin American evidence highlights the progressive integration of immediate breast reconstruction into regional oncological practice while identifying important limitations in the availability of multicenter studies and standardized outcome measurements. Strengthening regional research and expanding the evaluation of functional and patient-centered outcomes remain relevant priorities for improving the applicability of international evidence.

In conclusion, immediate breast reconstruction should be approached as an individualized, multidisciplinary process in which oncological safety remains the fundamental requirement and reconstructive selection is guided by clinical characteristics, anticipated treatments, functional considerations, and patient expectations. Future investigations should prioritize standardized assessment methods, objective functional measurements, and long-term follow-up to improve comparative evidence and support increasingly precise reconstructive decisions.

REFERENCIAS

- Basta, M. N., Gerety, P. A., Serletti, J. M., Kovach, S. J., & Fischer, J. P. (2015). A systematic review and head-to-head meta-analysis of outcomes following direct-to-implant versus conventional two-stage implant reconstruction. *Plastic and Reconstructive Surgery*, *136*(6), 1135–1144. https://doi.org/10.1097/PRS.0000000000001749

- Bennett, K. G., Qi, J., Kim, H. M., Hamill, J. B., Pusic, A. L., & Wilkins, E. G. (2018). Comparison of 2-year complication rates among common techniques for postmastectomy breast reconstruction. *JAMA Surgery*, *153*(10), 901–908. https://doi.org/10.1001/jamasurg.2018.1687
- de Carvalho Aguiar, I., Veiga, D. F., Marques, T. F., Novo, N. F., Sabino Neto, M., & Ferreira, L. M. (2017). Patient-reported outcomes measured by BREAST-Q after implant-based breast reconstruction: A cross-sectional controlled study in Brazilian patients. *The Breast*, *31*, 22–25. https://doi.org/10.1016/j.breast.2016.10.008
- de Oliveira, R. R., Morais, S. S., & Sarian, L. O. (2010). Efeitos da reconstrução mamária imediata sobre a qualidade de vida de mulheres mastectomizadas. *Revista Brasileira de Ginecologia e Obstetrícia*, *32*(12), 602–608. https://doi.org/10.1590/S0100-72032010001200007
- ElAbd, R., Jabori, S., Willey, B., El Eter, L., Oberoi, M. K., & Singh, D. (2024). Outcomes of immediate versus delayed autologous reconstruction with postmastectomy radiation: A meta-analysis. *Plastic and Reconstructive Surgery*, *154*(5), 851e–864e. https://doi.org/10.1097/PRS.0000000000011327
- Groth, A. K., Ono, M. C. C., Weihermann, V., Bastos, L. Z. B., Rezende, T. M. S., Dalke, D. B. Z., & Ferreira, C. I. B. (2020). A picture of breast reconstruction in a public oncology hospital in Latin America: A ten-year experience. *European Journal of Breast Health*, *16*(4), 244–249. https://doi.org/10.5152/ejbh.2020.5848
- Headon, H. L., Kasem, A., & Mokbel, K. (2016). The oncological safety of nipple-sparing mastectomy: A systematic review of the literature with a pooled analysis of 12,358 procedures. *Archives of Plastic Surgery*, *43*(4), 328–338. https://doi.org/10.5999/aps.2016.43.4.328
- Kelley, B. P., Ahmed, R., Kidwell, K. M., Kozlow, J. H., Chung, K. C., & Momoh, A. O. (2014). A systematic review of morbidity associated with autologous breast reconstruction before and after exposure to radiotherapy: Are current practices ideal? *Annals of Surgical Oncology*, *21*(5), 1732–1738. https://doi.org/10.1245/s10434-014-3494-z
- Matar, D. Y., Wu, M., Haug, V., Orgill, D. P., & Panayi, A. C. (2022). Surgical complications in immediate and delayed breast reconstruction: A systematic review and meta-analysis. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *75*(11), 4085–4095. https://doi.org/10.1016/j.bjps.2022.08.029
- Nolan, I. T., Farajzadeh, M. M., Bekisz, J. M., Boyd, C. J., Gibson, E. G., & Salibian, A. A. (2024). Prepectoral versus subpectoral breast reconstruction after nipple-sparing mastectomy: A systematic review and meta-analysis. *Plastic and Reconstructive Surgery–Global Open*, *12*(5), e5808. https://doi.org/10.1097/GOX.0000000000005808
- Ostapenko, E., Nixdorf, L., Devyatko, Y., Exner, R., Wimmer, K., & Fitzal, F. (2023). Prepectoral versus subpectoral implant-based breast reconstruction: A systematic review and meta-analysis. *Annals of Surgical Oncology*, *30*(1), 126–136. https://doi.org/10.1245/s10434-022-12567-0
- Pusic, A. L., Matros, E., Fine, N., Buchel, E., Gordillo, G. M., Hamill, J. B., Kim, H. M., Qi, J., Albornoz, C., Klassen, A. F., & Wilkins, E. G. (2017). Patient-reported outcomes 1 year after immediate breast reconstruction: Results of the Mastectomy Reconstruction Outcomes Consortium Study. *Journal of Clinical Oncology*, *35*(22), 2499–2506. https://doi.org/10.1200/JCO.2016.69.9561
- Rancati, A. O., Angrigiani, C. H., Hammond, D. C., Nava, M. B., Gonzalez, E. G., Dorr, J. C., Gercovich, G. F., Rocco, N., & Rostagno, R. L. (2017). Direct to implant reconstruction in nipple sparing mastectomy: Patient selection by preoperative digital mammogram. *Plastic and Reconstructive Surgery–Global Open*, *5*(6), e1369. https://doi.org/10.1097/GOX.0000000000001369
- Ren, Y., Yu, Y., Xu, K., Li, Z., & Wang, X. (2024). Meta-analysis of immediate implant-based breast reconstruction versus autologous breast reconstruction in the setting of postmastectomy radiotherapy. *Aesthetic Plastic Surgery*, *48*(10), 1940–1948. https://doi.org/10.1007/s00266-023-03430-y
- Santosa, K. B., Qi, J., Kim, H. M., Hamill, J. B., Wilkins, E. G., & Pusic, A. L. (2018). Long-term patient-reported outcomes in postmastectomy breast reconstruction. *JAMA Surgery*, *153*(10), 891–899. https://doi.org/10.1001/jamasurg.2018.1677
- Schaverien, M. V., Macmillan, R. D., & McCulley, S. J. (2013). Is immediate autologous breast reconstruction with postoperative radiotherapy good practice? A systematic review of the literature. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, *66*(12), 1637–1651. https://doi.org/10.1016/j.bjps.2013.06.059
- Wilkins, E. G., Hamill, J. B., Kim, H. M., Kim, J. Y., Greco, R. J., Qi, J., & Pusic, A. L. (2018). Complications in postmastectomy breast reconstruction: One-year outcomes of the Mastectomy Reconstruction Outcomes Consortium (MROC) study. *Annals of Surgery*, *267*(1), 164–170. https://doi.org/10.1097/SLA.0000000000002033

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review

- Yamashita, Y., Tsunoda, H., Nagura, N., Kajiura, Y., Yoshida, A., Takei, J., Suzuki, K., Watanabe, T., Iwahira, Y., Yamauchi, H., & Hayashi, N. (2021). Long-term oncologic safety of nipple-sparing mastectomy with immediate reconstruction. *Clinical Breast Cancer*, *21*(4), 352–359. https://doi.org/10.1016/j.clbc.2021.01.002
- Zhang, P., Li, C.-Z., Wu, C.-T., Jiao, G.-M., Yan, F., Zhu, H.-C., & Zhang, X.-P. (2017). Comparison of immediate breast reconstruction after mastectomy and mastectomy alone for breast cancer: A meta-analysis. *European Journal of Surgical Oncology*, *43*(2), 285–293. https://doi.org/10.1016/j.ejso.2016.07.006
- Zugasti, A., & Hontanilla, B. (2021). The impact of adjuvant radiotherapy on immediate implant-based breast reconstruction surgical and satisfaction outcomes: A systematic review and meta-analysis. *Plastic and Reconstructive Surgery–Global Open*, *9*(11), e3910. https://doi.org/10.1097/GOX.0000000000003910

Edición 5, Año 3, Número 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
Revista IECCMEXICO
Edition 5, Year 3, Number 2, 2026
E-ISSN: 3061-8045, P-ISSN: 3061-8517
IECCMEXICO Review