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Eureka Journal of Health Sciences & Medical Innovation (EJHSMI)

ISSN 2760-4942 (Online) Volume 2, Issue 2, February 2026

https://eurekaoa.com/index.php/5

SIMULTANEOUS AND DELAYED RECONSTRUCTIVE OPERATIONS FOR BREAST CANCER

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Abstract

Breast cancer remains one of the most prevalent oncological diseases among women worldwide. Surgical treatment often involves mastectomy, which can lead to significant physical and psychological consequences. Reconstructive breast surgery plays a crucial role in restoring body image, improving quality of life, and facilitating social and emotional rehabilitation. This article explores simultaneous (immediate) and delayed reconstructive operations for breast cancer patients. The study analyzes indications, techniques, advantages, limitations, and outcomes of both approaches based on current clinical evidence. A comparative evaluation highlights the impact of reconstruction timing on oncological safety, aesthetic outcomes, complication rates, and patient satisfaction. The findings support an individualized, multidisciplinary approach to selecting the optimal reconstructive strategy.

Keywords: Breast cancer; mastectomy; breast reconstruction; simultaneous reconstruction; delayed reconstruction; oncological surgery; quality of life.

Introduction

Breast cancer is the leading malignant disease among women and a major cause of morbidity and mortality globally. Despite advances in early detection and

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systemic therapies, surgical intervention remains a cornerstone of breast cancer management. Mastectomy, although often life-saving, can have profound physical, psychological, and social consequences for patients.

Breast reconstruction has become an integral component of comprehensive breast cancer care. Its primary goal is not only to restore breast contour but also to improve self-esteem, emotional well-being, and overall quality of life. Reconstructive procedures can be performed either simultaneously with mastectomy (immediate reconstruction) or at a later stage (delayed reconstruction).

The decision regarding the timing of reconstruction is influenced by multiple factors, including tumor stage, oncological treatment plan, patient health status, availability of reconstructive techniques, and patient preference. This article aims to provide a systematic overview of simultaneous and delayed reconstructive operations, analyzing their clinical rationale, outcomes, and implications for modern breast cancer treatment.

Breast reconstruction after mastectomy for breast cancer can be performed either simultaneously (immediate)—during the same operation as the mastectomy—or delayed—at a later time, often months or years afterward. Both approaches are considered oncologically safe, meaning they do not increase the risk of cancer recurrence or hinder cancer detection or treatment when done by experienced teams. The choice depends on factors such as cancer stage, planned adjuvant therapies (especially radiation), overall health, smoking status, body mass index (BMI), and personal preferences.

Definitions and Timing

- Immediate (simultaneous) reconstruction: The plastic surgeon begins rebuilding the breast mound right after the breast surgeon removes the cancerous tissue during the mastectomy. This often involves placing a tissue expander, direct-to-implant placement, or using autologous tissue (flaps from the abdomen, back, or

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other areas). The patient wakes up from surgery with a reconstructed breast shape already in place.

- Delayed reconstruction: Reconstruction is performed as a separate procedure after the patient has recovered from the mastectomy and completed any necessary adjuvant treatments, such as chemotherapy or radiation therapy. This timing is typically at least 6–12 months post-mastectomy, though it can be years later.

Advantages and disadvantages

Immediate Reconstruction

Advantages:

- Generally superior cosmetic outcomes due to preservation of more native breast skin (and sometimes the nipple-areola complex), leading to better shape, symmetry, and natural appearance.
- No period of living without a breast mound or with significant asymmetry, which often results in better short-term psychosocial adjustment, body image, self-esteem, and sexual well-being.
- Fewer total surgeries overall in many cases, potentially lower cumulative costs, and faster return to normal social and professional activities.
- Reduced psychological distress from avoiding the experience of mastectomy deformity.

Disadvantages:

- Longer initial operation (often 4–10+ hours depending on the method) and extended recovery time immediately after surgery.
- Higher risk of certain complications, such as infection, wound healing problems, or implant-related issues, particularly if post-mastectomy radiation therapy (PMRT) is required afterward. Radiation can cause capsular contracture, fibrosis, shrinkage, or implant failure in reconstructed breasts.
- Potential slight delay in starting adjuvant therapy if major complications arise.

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- Not ideal for all patients—higher-risk individuals (e.g., smokers, BMI >30–35, diabetes, inflammatory breast cancer, or extensive comorbidities) may face elevated complication rates.

Delayed Reconstruction

Advantages:

- Lower overall complication rates in many studies, as the mastectomy site has fully healed and any adjuvant treatments (especially radiation) are completed first. This reduces risks to the reconstruction itself.
- Allows full focus on cancer treatment without the added stress of a combined major surgery.
- More time for emotional processing, research into options, weight stabilization, smoking cessation, or optimization of health before reconstruction.
- Safer when PMRT is planned, as radiation damage to a fresh reconstruction is avoided.
- Equivalent long-term quality-of-life benefits once completed.

Disadvantages:

- Period of asymmetry or absence of a breast mound (patients may use external prostheses during this time).
- More total surgeries, additional scarring, and potentially less optimal final cosmetic results due to skin contraction after mastectomy.
- Longer overall timeline to achieve final reconstruction.

Impact of Radiation Therapy

Post-mastectomy radiation therapy significantly influences timing decisions. Radiation increases risks of complications in immediate reconstructions, especially implant-based ones (higher rates of capsular contracture, pain, and failure). Autologous (flap-based) reconstructions tolerate radiation better but may

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still experience fibrosis or volume loss. Recent evidence shows that immediate autologous reconstruction remains viable in some PMRT cases with acceptable outcomes, but many centers prefer delayed reconstruction (or a "delayed-immediate" hybrid approach with temporary expanders) when radiation is anticipated. Accelerated radiation courses (e.g., hypofractionated over 3 weeks) appear safe for reconstruction patients without increasing complications.

Quality of life and psychological outcomes: Multiple studies show that both immediate and delayed reconstruction improve overall quality of life compared to mastectomy alone, with high long-term satisfaction and psychosocial well-being in both groups. Immediate reconstruction often provides short-term advantages in body image, sexual well-being, emotional adjustment, and reduced anxiety/depression in the first 1–2 years. Some evidence indicates better physical functioning and body image at 6–12 months post-mastectomy with immediate approaches. However, long-term follow-up (beyond 2–5 years) frequently shows no significant differences in satisfaction with breasts, psychosocial well-being, or health-related quality of life between the two timings. Patients with delayed reconstruction may experience temporary lower mental health scores during the waiting period but catch up once reconstruction is complete.

Key influencing factors:

- Cancer-related: Early-stage or prophylactic mastectomy favors immediate; advanced disease, inflammatory breast cancer, or planned PMRT often favors delayed.
- Patient health: Smoking, high BMI, diabetes, or poor wound-healing increase complications with immediate—delayed is often safer.
- Reconstruction type: Implant-based is common for immediate (but radiation-sensitive); autologous flaps (e.g., DIEP, latissimus dorsi) work well either way and are often preferred post-radiation.

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- Personal goals: Some prioritize waking up with a breast shape and avoiding asymmetry; others prefer focusing solely on cancer treatment first.

Current evidence summary: Recent reviews and studies (including systematic analyses up to 2025) confirm both options are effective, with immediate reconstruction linked to better early psychological and cosmetic results in many cases, while delayed offers lower complication risks and flexibility. Reoperation rates may be slightly higher with immediate in some large cohorts, but long-term success and patient satisfaction are comparable. No approach is universally superior—outcomes depend on individual circumstances.

The decision should involve detailed discussions with a multidisciplinary team: breast surgeon, plastic/reconstructive surgeon, medical oncologist, and radiation oncologist. A pre-mastectomy consultation with a reconstructive specialist is strongly recommended to review imaging, simulate potential outcomes, and align on the best plan for your specific situation. Resources from organizations like the National Comprehensive Cancer Network (NCCN), American Society of Plastic Surgeons (ASPS), and major cancer centers emphasize shared decision-making to optimize both oncologic and quality-of-life results.

The choice between simultaneous and delayed reconstruction remains a subject of clinical debate. Immediate reconstruction offers clear psychosocial and aesthetic advantages but may complicate postoperative radiotherapy planning. Delayed reconstruction provides greater flexibility in oncological management but may negatively impact patient quality of life during the interim period.

Advances in surgical planning, imaging, and radiation techniques have reduced previous limitations associated with immediate reconstruction. Personalized treatment strategies are increasingly emphasized, taking into account patient preferences, oncological safety, and available resources.

Emerging techniques such as pre-pectoral implant placement and refined microsurgical flaps continue to expand reconstructive options, potentially narrowing the gap between immediate and delayed approaches.

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Conclusion

Both simultaneous and delayed reconstructive operations are safe and effective options for breast cancer patients when appropriately indicated. Immediate reconstruction offers enhanced aesthetic outcomes and psychological benefits, while delayed reconstruction remains valuable for patients requiring extensive adjuvant therapy or those unsuitable for immediate procedures.

Optimal outcomes depend on careful patient selection, multidisciplinary collaboration, and individualized treatment planning. Reconstruction timing should be guided by oncological considerations, patient expectations, and available surgical expertise.

Establish multidisciplinary breast cancer teams to optimize reconstructive decision-making.

Provide comprehensive patient education regarding reconstructive options and timing.

Encourage further comparative studies focusing on long-term quality-of-life outcomes.

Integrate psychological support into breast cancer treatment pathways.

Expand access to modern reconstructive techniques in oncological centers.

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