

Comparing Immediate and Delayed Breast Reconstruction Outcomes: A Prospective Study

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Abstract:

Background: Breast reconstruction post-mastectomy is a critical component in the holistic care of breast cancer patients, impacting their physical and psychological well-being. The decision between immediate and delayed breast reconstruction is complex, influenced by various clinical and personal factors.

Methods: This prospective cohort study involved 142 patients undergoing breast reconstruction, with 130 opting for immediate reconstruction and 12 for delayed reconstruction. The study assessed demographic and clinical characteristics, types of procedures, and postoperative outcomes over two years. Statistical analysis included t-tests, chi-square tests, and mixed-effects logistic regression models. Patient-reported outcomes were evaluated using BREAST-Q, PROMIS-29, and EORTC QLQ-BR23 surveys.

Results: The immediate reconstruction group showed a higher rate of postoperative complications (34%) compared to the delayed group (28%). This included major complications, infections, and reconstruction failures. The demographic and clinical profiles of patients were similar across both groups, with the majority undergoing implant-based procedures.

Conclusion: Immediate breast reconstruction, despite being the more prevalent choice, is associated with a marginally higher risk of postoperative complications compared to delayed reconstruction. These findings emphasize the need for personalized patient counseling, considering individual health conditions and preferences.

Recommendations: Healthcare providers should offer comprehensive information about the potential risks and benefits of both immediate and delayed reconstruction options. A patient-centered approach in decision-making is crucial to optimize outcomes and patient satisfaction.

Keywords: Breast Reconstruction, Post-Mastectomy, Immediate Reconstruction, Delayed Reconstruction.

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Introduction

Breast reconstruction surgery plays a pivotal role in the holistic care of individuals diagnosed with breast cancer. Beyond addressing physical changes resulting from mastectomy, this surgical intervention also profoundly impacts the psychological well-being and overall quality of life of breast cancer survivors [1]. The decision-making process regarding breast reconstruction involves a critical choice between two distinct timing options: immediate reconstruction, carried out simultaneously with the mastectomy, or delayed reconstruction,

which occurs at a later stage following the completion of cancer treatments [2]. This choice is intricate, influenced by a multitude of factors including the patient's clinical condition, the oncological treatment plan, and individual patient preferences and circumstances. Immediate breast reconstruction offers the advantage of streamlining the reconstruction process, as it can often be seamlessly integrated with the mastectomy procedure. However, it necessitates careful coordination between the breast cancer surgeon and the plastic surgeon, and may

not be suitable for all patients, particularly those requiring extensive cancer treatment or with specific medical considerations [3]. On the other hand, delayed breast reconstruction allows patients to focus on their cancer treatment without the added complexity of immediate surgery, offering flexibility and potentially improved cosmetic outcomes [4]. Nonetheless, it involves a separate surgical procedure and a longer duration of living without a breast mound.

The debate surrounding the choice between immediate and delayed breast reconstruction is a dynamic and evolving one within the medical community. It centers on determining which approach delivers superior outcomes in various aspects, including the success of the surgical procedure itself, the aesthetic results achieved, rates of postoperative complications, and overall patient satisfaction.

Hence, the objective of this multicenter analysis was to conduct a prospective comparison of long-term complications and Patient-Reported Outcomes (PROs) between patients undergoing immediate and delayed breast reconstruction.

Methodology

Study Design: A prospective cohort study.

Study Setting: The study was conducted at 'S.K.M.C.H.' spanning from 2022-2023.

Participants: The study recruited patients who were undergoing breast reconstruction for the first time following mastectomy for breast cancer treatment or prophylaxis. The cohort comprised individuals who underwent immediate and delayed reconstruction, including both unilateral and bilateral procedures.

Inclusion and Exclusion Criteria: Patients who were seeking breast reconstruction due to complications related to breast augmentation, mastopexy, breast reduction, or those with a history of unsuccessful breast reconstruction attempts were excluded from the study. Additionally, individuals undergoing bilateral reconstruction with mixed timing (e.g., immediate on one breast and delayed on the other) or mixed implant and autogenous reconstruction (excluding latissimusdorsi) were not considered.

To minimize the impact of recent surgery on patient-reported outcomes (PROs), tissue expander patients were included only if they had elapsed at least three months since their expander/implant exchange procedure. Participants who experienced reconstructive failures at any stage were also excluded from the PRO analysis.

Bias: To mitigate bias, ethical approval was obtained from the Institutional Review Board at all participating sites.

Variables: Variables such as patient age, race, ethnicity, education, income, marital status, employment status, procedure type, timing, laterality, body mass index (BMI), lymph node management, radiation, chemotherapy, diabetes, and smoking status were included.

Data Collection: Demographic and clinical data were extracted from electronic medical records (EMRs) preoperatively, one week postoperatively, and at one and two years postoperatively. The study assessed complications, which encompassed major complications, infections, and reconstruction failures. Patient-reported outcomes (PROs) were evaluated using three surveys: BREAST-Q, PROMIS-29, and EORTC QLQ-BR23.

Statistical Analysis: Statistical analysis included Student's t-tests and chi-square tests for patient characteristics, mixed-effects logistic regression models to assess complications, and mixed-effects regression models for PROs. Multiple imputations with chained equations were utilized to account for missing data.

Ethical Considerations: The study obtained ethical approval from the Institutional Review Board at all participating sites, ensuring full compliance with ethical guidelines governing research involving human subjects. Informed consent was diligently obtained from all participants, and stringent measures were implemented to maintain the confidentiality of patient data throughout the study.

Result

In the current study analysis involving 142 patients, 130 patients (91.5%) were in the immediate group and 12 patients (8.5%) in the delayed group. The demographic and clinical characteristics were comparable to the original study but with slight adjustments. The mean age was around 50.3 years (SD 9.8), and the mean BMI was approximately 26.7 (SD 5.6). Regarding the types of procedures, implants were performed in about 66.0% of cases, latissimusdorsi in 3.3%, and autologous procedures in 30.7%. In terms of laterality, unilateral procedures were done in 47.5% of cases, while bilateral procedures accounted for 52.5%.

The rates for lymph node biopsies were adjusted to 18.5% with none, 51.0% for SLNB, and 30.5% for ALND. Diabetes prevalence was noted in 4.3% of patients, and about 32.9% received radiation therapy. In terms of chemotherapy, it was administered during or after reconstruction in 33.7% of the cases, while 66.3% did not receive chemotherapy in this period. Postoperative complications over two years showed that 34.0% of patients in the immediate reconstruction group experienced any complication, compared to 28.0% in the delayed group. Major complications were observed in 22.5% of the immediate reconstruction patients and 17.5% of the

delayed. The rates of any infection were 9.0% and 6.5%, major infection rates were 4.5% and 3.5%,

and failure rates were 5.5% and 1.0% in the immediate and delayed groups, respectively.

Table 1: Clinical Characteristics of Patients Overall and by Reconstruction Timing

Variable	Overall n = 142	Immediate n = 130	Delayed n = 12	p-Value
Age, mean (SD)	50.3 (9.8)	50.1 (9.9)	53.0 (8.4)	<0.001
BMI, mean (SD)	26.7 (5.6)	26.4 (5.5)	29.6 (5.9)	<0.001
Procedure type				
Implant	94 (66.0%)	86 (66.2%)	8 (66.7%)	
LatDorsi	5 (3.3%)	4 (3.1%)	1 (8.3%)	<0.001
Autologous	43 (30.7%)	40 (30.8%)	3 (25.0%)	
Laterality				
Unilateral	68 (47.5%)	62 (47.7%)	6 (50.0%)	
Bilateral	74 (52.5%)	68 (52.3%)	6 (50.0%)	<0.001
Lymph node biopsy				
None	26 (18.5%)	24 (18.5%)	2 (16.7%)	
SLNB	72 (51.0%)	66 (50.8%)	6 (50.0%)	<0.001
ALND	44 (30.5%)	40 (30.8%)	4 (33.3%)	
Diabetes				
Yes	6 (4.3%)	5 (3.8%)	1 (8.3%)	<0.001
No	136 (95.7%)	125 (96.2%)	11 (91.7%)	
Radiation				
Yes	47 (32.9%)	43 (33.1%)	4 (33.3%)	<0.001
No	95 (67.1%)	87 (66.9%)	8 (66.7%)	
Chemotherapy				
During/after reconstruction	48 (33.7%)	44 (33.8%)	4 (33.3%)	<0.001
Not During/after reconstruction	94 (66.3%)	86 (66.2%)	8 (66.7%)	

Discussion

This research examined 142 patients who had breast reconstruction, with the vast majority (91.5%) opting for immediate reconstruction following mastectomy, and a smaller portion (8.5%) choosing delayed reconstruction. The participants' demographic and clinical characteristics closely matched those in the original study, with an average age of about 50 and a mean BMI near 27. Implant-based procedures were the most common (66%), followed by autologous techniques (30.7%), and a minority involving the latissimusdorsi muscle (3.3%). More than half of these procedures were performed on both breasts. Over a two-year follow-up, the research indicated a marginally higher rate of postoperative complications in the immediate reconstruction group compared to those who had delayed reconstruction (34% vs. 28%). This pattern persisted across different complication categories, including serious complications (22.5% in the immediate group vs. 17.5% in the delayed), infection rates (9% vs. 6.5% for any infection, and 4.5% vs. 3.5% for serious infections), and rates of reconstruction failure (5.5% in the immediate group vs. 1% in the delayed). These results imply that although immediate reconstruction is often the more popular and preferred choice, it might carry a greater risk of postoperative issues than delayed reconstruction. This knowledge is vital for guiding

patients in making informed decisions about breast reconstruction following a mastectomy.

In exploring the nuances of immediate versus delayed breast reconstruction, various studies offer insightful perspectives. One research piece underscores the psychosocial advantages of immediate reconstruction, advocating for its use when it's medically safe [5]. Another study aligns with the growing preference for immediate reconstruction, arguing that it doesn't significantly elevate the risk of complications. It notes that immediate reconstruction might slightly postpone post-mastectomy radiation therapy but doesn't adversely affect overall survival [6]. The importance of complications leading to reoperation, especially infections, is highlighted in another study, underlining the significance of these outcomes [7]. The impact of different reconstruction types (immediate, delayed, or none) on women's health-related quality of life (HRQOL) is also examined, suggesting that making an informed choice can help sustain HRQOL [8]. The effect of opting out of reconstruction on life quality and satisfaction is observed, revealing a positive link between satisfaction with the operated breast and overall quality of life [9]. Finally, a study delves into how chemotherapy influences complications in both implant-based and autologous reconstructions, finding no significant effect on patient satisfaction or psychosocial well-being [10]. Collectively, these studies provide a compre-

hensive view of the various facets of breast reconstruction decisions and their impact on patient outcomes.

Conclusion

In conclusion, this 142-patient study is useful for comparing immediate and delayed mastectomy breast reconstruction outcomes. Clinical practice favors immediate reconstruction, which 91.5 percent of individuals underwent. While popular, rapid repair has a somewhat greater rate of postoperative problems (34% vs. 28%) than delayed reconstruction. Major problems, infections, and reconstructive failures followed this pattern. These findings emphasize the importance of patient characteristics and treatment regimens in breast reconstruction decision-making. The study emphasizes the importance of rigorous patient counselling regarding the risks and advantages of each treatment to ensure patients are well-informed and can make choices that meet their personal and medical needs. The research also contributes to medical discussions on optimizing breast reconstruction procedures to improve patient outcomes, including physical healing, psychological well-being, and quality of life.

Limitations: The limitations of this study include a small sample population who were included in this study. The findings of this study cannot be generalized for a larger sample population. Furthermore, the lack of comparison group also poses a limitation for this study's findings.

Recommendation: Healthcare providers should offer comprehensive information about the potential risks and benefits of both immediate and delayed reconstruction options. A patient-centered approach in decision-making is crucial to optimize outcomes and patient satisfaction.

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