

Immediate Symmetrization of the Contralateral Breast in Breast Reconstruction–Revision, Complications, and Satisfaction: A Systematic Review

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Background: It is desirable to achieve breast symmetry after unilateral surgery for breast tumors. Thus, contralateral balancing is often required, but it is still debated whether symmetrization surgery should be performed alongside reconstruction or as a delayed procedure. Therefore, we aimed to compare revision rates, complication rates, and satisfaction levels between those who underwent immediate versus delayed symmetrization.

Methods: A systematic review was designed to summarize the revision surgery rates, complication rates, and satisfaction levels of patients who underwent contralateral breast symmetrization at the same time as breast reconstruction. We included articles published between 2010 and 2022 in databases such as PubMed, MEDLINE, and Embase.

Results: Most studies showed no difference or lower revision rates for immediate symmetrization, except for one study where immediate symmetrization had a revision rate twice that of delayed symmetrization. There were no significant differences in complication rates between the two groups. Regarding satisfaction levels, most studies showed that the immediate group had higher scores regardless of statistical significance; however, breast-related satisfaction was significantly higher in the immediate group than in the delayed group.

Conclusion: This systematic review demonstrates that immediate symmetrization surgery does not increase revision surgery and complication rates or decrease satisfaction levels. (*Plast Reconstr Surg Glob Open* 2024; 12:e5586; doi: 10.1097/GOX.0000000000005586; Published online 7 February 2024.)

INTRODUCTION

Surgical management of breast cancer involves all types of mastectomy and breast-conserving therapy (BCT), which includes wide local excision (or lumpectomy), followed by radiation therapy. This is the standard management of early-stage invasive breast cancer and provides more satisfactory cosmetic outcomes.^{1,2} Randomized controlled trials have shown that post-BCT survival is equivalent to that after mastectomy.³⁻⁶ However, some studies report highly unsatisfactory aesthetic results after BCT, affecting patients' psychosocial well-being and quality of life.^{1,2,7,8} However, BCT

combined with breast reconstruction has shown better psychosocial outcomes.^{1,9-11}

The satisfaction of breast cancer patients is not only about eliminating the disease but also about achieving aesthetic and symmetrical breasts, which requires balancing and contralateral breast procedures by either reduction, mastopexy, or augmentation.¹²⁻¹⁴ Therefore, most breast reconstructions are accompanied by contralateral breast procedures to improve symmetry.^{12,15-19} In particular, it is very difficult to achieve satisfactory aesthetic outcomes in patients with ptotic and large breasts.^{1,2}

The timing of the contralateral balancing procedure remains controversial in the field of breast reconstruction, although aesthetic and symmetrical breast reconstruction is now regularly performed to achieve better outcomes.³⁻⁵ Some surgeons prefer immediate symmetrization to reduce the number of procedures and admissions,

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decrease complications to achieve immediate psychological wellness, and increase satisfaction level, quality of life, and cost-effectiveness. However, some prefer delayed symmetrization to reduce blood loss, surgery time, and morbidities; obtain the final size of the reconstructed breast after radiation therapy; and reduce revision procedures.

Therefore, this review aimed to determine the need for revision surgery in patients who underwent immediate symmetrization at the same time as breast reconstruction with delayed surgery and to determine the complications and satisfaction levels.

METHODS

We conducted a systematic review to evaluate the revision rates, complications, and satisfaction levels of patients who underwent immediate symmetrization of the contralateral breast during breast reconstruction. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were used in this systematic review.

Information Sources and Search Strategy

We conducted a systematic search of electronic databases, such as PubMed, MEDLINE, and Embase. Additional relevant articles were retrieved by manually searching the reference lists of identified articles. The main author and two reviewers conducted the search using the following keywords: “immediate” AND “delayed” AND “breast reconstruction” AND “symmetry AND “symmetrization” AND “breast.”

Inclusion and Exclusion Criteria

This article primarily aimed to identify all studies that reported the revision rates for patients who underwent immediate contralateral breast symmetrization with breast reconstruction on the other side. The minor objective was to determine the complication rates and satisfaction levels of those patients. We included studies of patients who underwent immediate balancing for the contralateral side alongside breast reconstruction with or without comparisons with delayed balancing for the contralateral side. We excluded unrelated, duplicated, and unavailable full texts, abstract-only articles, nonhuman studies, case reports, case series, new techniques, conferences, editorials, author response theses, books, and systematic reviews.

Study Endpoints

The primary endpoint of this study was the revision surgery rate among the patients who underwent immediate balancing for the contralateral side at the same time as the breast reconstruction, and the secondary endpoints were the complications, satisfaction levels, and possible comparisons with patients who underwent delayed balancing for the contralateral side.

Data Abstraction and Study Selection

We searched papers published between 2010 and 2022, with their reference lists, and imported them into

Takeaways

Question: Does contralateral breast immediate symmetrization in breast reconstruction increase the revision rate and complications, and increase the satisfaction level?

Findings: The systematic review demonstrates that immediate symmetrization surgery does not increase the revision surgery and complication rates or decrease the satisfaction level.

Meaning: Immediate symmetrization surgery for the patient who will undergo breast reconstruction may decrease the number of procedures and complications and increase the satisfaction level and cost-effectiveness, and should depend on the patient’s condition and comorbidities.

reference manager software (Endnote) files, where each study was reviewed and screened for duplicate texts, systematic reviews, and unrelated studies. Thereafter, full-text article screening was performed, and details about the year of publication, study type, and inclusion criteria were collected. Any disagreements were resolved by a third reviewer.

RESULTS

Characteristics of the Included Studies

Our initial search identified 1235 citations in different databases; however, 43 duplicate articles were removed, and the 1192 remaining articles were considered for full-text screening (Fig. 1). We reviewed the titles and abstracts of the remaining studies and identified 48 relevant abstracts. Thirty-five studies did not meet our inclusion criteria after reviewing their full texts. Hence, the full texts of 13 articles were incorporated into the review. (See **table, Supplemental Digital Content 1**, which shows characteristics of the studies included in the systematic review and the results. <http://links.lww.com/PRSGO/D54>.)

Revision Rates

Eight of 12 studies compared the revision rates of immediate and delayed balancing. Casella et al showed that reoperation was performed in six (16.6%) patients for immediate symmetrization versus six (14.3%) for delayed symmetrization.²⁰ Rancati et al found a similar revision rate for immediate versus delayed balancing (38.3% versus 49.3%, $P = 0.17$) without specifying the breast that underwent reconstruction or symmetrization.²¹ In the study by Deigni et al, revision surgery was significantly more frequent in delayed symmetrization than in immediate symmetrization (12.4% versus 6%, $P = 0.026$).²²

Giordano et al found significant differences in fat grafting revisions, which were higher in the delayed group; however, the revision rate was 24% in the immediate group and 43.3% in the delayed group, with no significant differences.²³ Wade et al showed that delaying the balancing procedure substantially increased the risk of revision surgery in reconstructed breasts and the abdomen, but on the balancing side, the risk of revision surgery was not

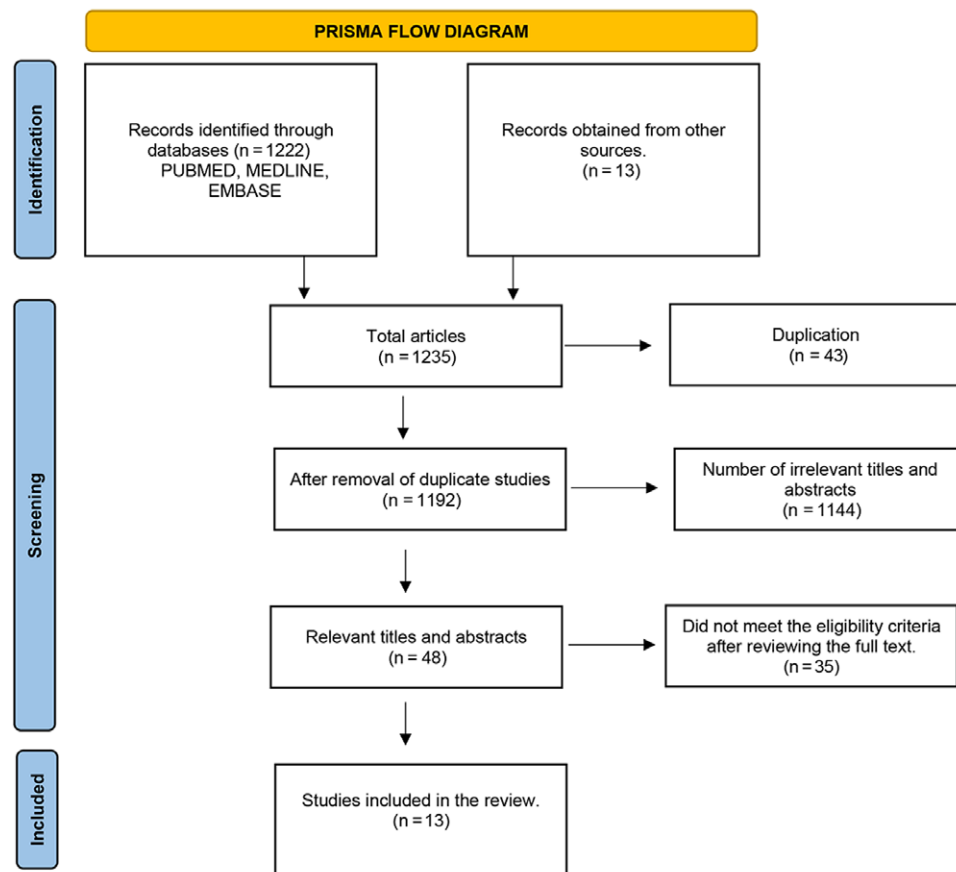


Fig. 1. PRISMA was used for the selection mechanism schedule of articles.

statistically significant for immediate balancing (3.87%) and also for delayed balancing (18.2%).²⁴

Two (6.5%) and six (36.3%) patients required revision of the contralateral symmetrization procedure in the immediate and delayed groups, respectively, in the study by Laporta et al.²⁵ Chang et al found that the immediate group had a revision rate that was twice that of the delayed group (34.4% versus 15.4%, $P < 0.0001$).²⁶

In the study by Inbal et al, no major secondary procedures were performed in either group.²⁷ Five of the 12 studies included immediate cases alone, without comparing them to delayed balancing. There were no revision procedures in three studies.^{28–30} In the study by Smith et al, only one of 102 patients needed revision surgery for the contralateral breast, and three required revision surgery for both breasts.³¹ The fifth study did not include revision surgery.³²

Complications Rate

Complication rates were noted in three of eight studies that compared immediate and delayed symmetrization. The first study showed no significant differences in complication rates, the second reported no major complication, and the third reported no complications in immediate symmetrization and two complications (0.93%) for delayed symmetrization.^{23–25}

Three studies did not mention the specific complications, and two did not mention the complication rate.^{20–22,26,27} Four of five studies included immediate cases alone without comparisons with delayed symmetrization. Two studies did not report any major complications,^{29,30} with only one case of complications (0.98%) in the third study.³¹ The fourth study was not specific regarding the side of the complications.²⁸

Satisfaction Level

Four of eight studies compared immediate and delayed balancing and measured satisfaction levels. Casella et al showed that all BREAST-Q domains were higher in the immediate balancing group, but only satisfaction with the breast score was significantly higher in the immediate group than in the delayed group ($P < 0.05$).²⁰

Rancati et al found similar outcomes in both groups concerning BREAST-Q and SF-36 parameters, with no significant differences, except for psychosocial well-being, which was higher in the immediate group.²¹ Laporta et al used a modified grading scale originally described by Cohen et al, with a high score for the general satisfaction subitems without a significant difference between the immediate and delayed groups.^{25,33}

Table 1. Summary of the Results

Satisfaction Level	Complication Rate	Revision Surgery Rate	
BREAST-Q. All the domains were higher in the immediate symmetrization group, but only the satisfaction with the breasts score had a statistically higher result in the immediate symmetrization group than in the delayed symmetrization group ($P < 0.05$)	Not specific	I = 7/42 (16.6%), D = 6/42 (14.3%), not on the balancing side	Immediate (I) and delayed (D) balancing studies = 8
BREAST-Q and SF-36 parameters in both groups reported similar outcomes when comparing their satisfaction with treatment. No statistically significant difference was demonstrated between the cohorts; however, psychosocial well-being was rated higher in group I	Not specific	Not specific Overall revision, a similar rate of revision I vs D (38.3% vs. 49.3%, $P = 0.17$)	
NA	Not specific	I = 17/284 (6%), D = 18/145 (12.4%)	
NA	No significant differences	I = 12/48(24%), D = 13/30 (43.3%)	
NA	I = 0 (0%), D = 2 (0.93%)	I = 36/155(23.2%), D = 12/22 (54.5%)	
General satisfaction subitems got high score evaluation without significant difference between survey results from I and D group	No complications	I = 2/31(6.5%), D = 6/17(36.3%)	
NA	NA	I = 53/154 (34.4%), D = 61/397 (15.4%)	
BREAST-Q I = 87.97% compared with D = 84.81%	NA	I = 4/33, D = 1/8,	
BREAST-Q. In all domains, patients reported high levels of satisfaction with outcomes	Not specific	I = 0/60 (0%)	Immediate (I) balancing studies = 5
BREAST-Q high satisfaction with the overall outcome with an average score of 80.8%	No major complications	I = 0/48 (0%)	
BREAST-Q score, high to very high in all patients	No major complications	I = 0/19 (0%)	
NA	I = 1/102 (0.98%)	I = 4/102 (3.9)	
The mean satisfaction score was calculated as the patient score plus the team score divided by two, The average satisfaction score was 8/10.	NA	NA	
8	7	12	Total = 13

In the study by Inbal et al, the BREAST-Q score for immediate balancing was 87.97 compared with a score of 84.81 for delayed balancing ($P = 0.42$), without a significant difference between the two groups in any of the BREAST-Q patient satisfaction scores.²⁷ Five of 12 studies included immediate cases alone, without comparing them with delayed balancing, and four studies measured satisfaction levels. In three of these, the BREAST-Q score was high in all domains, with high satisfaction with the outcomes.^{28–30} Webster et al used the mean satisfaction score, calculated as the patient score plus the team score divided by two, with an average satisfaction score of 8 of 10 (Table 1).³²

DISCUSSION

The timing for contralateral balancing is still debated in breast reconstruction. Although aesthetic and symmetrical breast reconstruction is regularly performed as patients desire, the optimal time is still controversial. Our study focused on patient safety and satisfaction parameters, including revision surgery rate, complication rate, and level of patient satisfaction.

We thought that immediate balancing surgery would increase the revision surgery rate. However, the literature showed that most studies showed either no difference or lower revision surgery rates. The range for immediate

symmetrization is 6.5%–38.3%, and 12.4%–54.5% for delayed, except for the study by Chang et al, which showed that immediate symmetrization had twice the revision rate of delayed symmetrization (I = 34.4% and 15.4%, respectively), specifically in the patients who underwent augmentation and mastopexy, but those who had reduction mammoplasty did not demonstrate any difference²⁶

Although complication rates were not specifically mentioned for the side that underwent symmetrization, they were included in the general complications. Nevertheless, some studies showed no differences in complication rates between the two groups, and no study reported that complication rates were higher in the immediate group.^{23–25}

Regarding satisfaction, most studies showed that immediate symmetrization had higher scores, regardless of statistical significance, but the breast satisfaction score was significantly higher in the immediate group than in the delayed group ($P < 0.05$).² Additionally, psychosocial well-being was higher in the immediate group.²¹

According to the techniques of contralateral symmetrization, four studies were doing reduction mammoplasty, three were mastopexy and reduction mammoplasty, and six were implant-augmentation mastopexy and reduction mammoplasty.

The types of balancing procedures and their relation to the revision surgery were varied. For reduction

mammoplasty and mastopexy, immediate symmetrization was 0% to 24%, and delayed symmetrization was 0% to 43.3%, and for the augmentation, it was calculated in some studies with reduction mammoplasty and mastopexy.

The types of breast reconstruction in the studies varied. The reconstruction in two studies was two-stage breast reconstruction with tissue expander and then breast implant, in four studies was oncoplastic surgery, and in one study included both techniques. In six studies, the majority of autologous breast reconstruction was deep inferior epigastric artery perforator (DIEP) flap reconstruction, followed by transverse rectus abdominis myocutaneous (TRAM) and latissimus dorsi flap.

For the Chang et al article, which only showed that immediate symmetrization had twice the revision rate of delayed symmetrization, the type of breast reconstruction was muscle-sparing TRAM flap (43.2%), DIEP flap (26.3%), and full-muscle TRAM flaps (19.4%), and his technique for the contralateral symmetrization were reduction, mastopexy, and augmentation mammoplasty with more revision rate for mastopexy, and augmentation group.

Due to the difference in breast reconstruction procedures from autologous and implant-based and the balancing procedures in the articles and the small number of articles, subgroup analysis was not feasible and had a lot of effects that changed the result.

The long follow-up for similar cases is crucial, especially due to changes on the reconstructed side and balancing either naturally or due to receiving radiation therapy. The minimal follow-up in this review was 12 months or more, with a maximum of 120 months of follow-up, while three studies failed to provide follow-up information, especially for the only study that mentioned that immediate symmetrization had twice the revision rate of delayed symmetrization.²⁹

Immediate symmetrization surgery for patients undergoing breast reconstruction may decrease the number of procedures and complications and may increase satisfaction and cost-effectiveness. However, decreasing surgical time and blood loss should be considered. The timing for symmetrization is mostly at the surgeon's discretion currently, considering the comorbidity status, scheduled treatment plan, and personal desire of the patient.

The types of balancing symmetrization procedures may vary due to the heterogeneity of patient populations, BMI, and patient expectations regarding the result and their satisfaction, so choosing the ideal procedures may be difficult. Therefore, future studies are crucial to specific patient profiles. Our review has limitations regarding the few patients and studies that compared the two surgery types. More long-term prospective studies involving multiple centers seem necessary to obtain sufficient data.

CONCLUSIONS

This systematic review demonstrates that immediate symmetrization surgery does not increase revision surgery

and complication rates or decrease satisfaction levels. However, the few studies and large variation of data within the reviewed articles should be considered while interpreting the results of the review.

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DISCLOSURE

The author has no financial interest to declare in relation to the content of this article.

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