

COMPARATIVE ANALYSIS OF SURGICAL OUTCOMES: IMMEDIATE VS. DELAYED AUTOLOGOUS BREAST RECONSTRUCTION IN BREAST MALIGNANCY PATIENTS

Plastic Surgery

Dr Richa Jaiman Professor, Department of surgery , S.N. Medical College, Agra, U.P., India.

Dr Bhavna Verma Assistant professor, Department of surgery , S.N. Medical College, Agra, U.P., India.

Dr Ashish Manohar Junior resident, Department of surgery , S.N. Medical College, Agra, U.P., India.

Dr Deep Shikha* Assistant professor, Department of surgery , S.N. Medical College, Agra, U.P., India.
*Corresponding Author

ABSTRACT

Background And Aims: Breast cancer remains the most prevalent malignancy in women globally. Mastectomy significantly affects physical and psychological health, with reconstruction being a key element in improving body image and quality of life. This study aims to compare the outcomes of immediate autologous breast reconstruction (IABR) and delayed autologous breast reconstruction (DABR) in breast cancer patients, focusing on patient satisfaction, complication rates, and long-term health impacts. **Methods:** A prospective comparative study was conducted at S.N. Medical College, Agra, from August 2022 to April 2024. Ninety patients aged 18-50 years, meeting the inclusion criteria, were divided into two groups: IABR and DABR. Group I (IABR) underwent reconstruction within 18 hours of mastectomy, while Group II (DABR) had surgery 3-6 months post-mastectomy. Patient consent was obtained, and data on age, stage, comorbidities, surgical outcomes, and satisfaction were analysed using chi-square and t-tests (p-values <0.05 considered significant). **Results:** There were no significant differences in operation time (p=0.9751), blood loss (p=0.9377), or incidence of flap necrosis between groups. Post-operative pain (VAS) scores were higher in IMBR. Satisfaction rates were greater in the DABR group (LD Flap: 96.66% vs. 90%). **Conclusion:** While both IMBR and DABR are oncologically safe, DABR offers higher patient satisfaction, with fewer post-operative complications, making it preferable for patients likely to receive radiation.

KEYWORDS

Breast malignancy, immediate vs delayed Breast Reconstruction ,Postoperative Complications; Quality of Life.

INTRODUCTION

Breast cancer is the most prevalent malignancy among women worldwide, with one in eight women likely to face the diagnosis in their lifetime.¹ The treatment of breast cancer, particularly mastectomy, significantly impacts a woman's physical and emotional well-being, often leaving her with a sense of altered body image, sexual dysfunction, and reduced self-esteem.² As breast reconstruction has become a crucial step in the treatment journey, it offers patients not only a new breast shape but also a significant improvement in quality of life, self-esteem, and psychological health.³ The two main types of reconstruction – immediate and delayed – provide distinct advantages and challenges.⁴

Immediate autologous breast reconstruction (IABR) is performed concurrently with mastectomy, offering the benefits of a single surgery, better aesthetic results due to the preservation of the breast skin envelope, and an immediate improvement in body image. However, it carries risks, particularly for patients who require post-mastectomy radiation therapy, which can lead to complications such as fat necrosis and delayed wound healing. On the other hand, delayed autologous breast reconstruction, typically performed after the completion of cancer treatment, allows the patient to focus on healing first, thereby reducing the risk of complications but often leaving patients with prolonged psychological stress due to the absence of breast reconstruction for an extended period.^{5,6}

This study seeks to compare the outcomes of immediate versus delayed autologous breast reconstruction in patients with breast malignancy. It aims to investigate differences in patient satisfaction, complication rates, and overall health impacts, thereby providing valuable insights that can guide clinical decision-making and improve the quality of life for breast cancer survivors. By examining both short-term and long-term outcomes, this study intends to fill gaps in existing literature, offering a comprehensive comparison of the two approaches.

MATERIALS AND METHODS

From August 2022 to April 2024, a prospective comparative study was conducted at S.N. Medical College, Agra, in the Surgery Department, in collaboration with the Departments of Cancer and Radiation. The study included patients diagnosed with FNAC-proven breast cancer who underwent post-mastectomy procedures. A minimum of 90 patients were selected based on specific inclusion and exclusion criteria, and they were divided alternately into two groups: Immediate

Autologous Breast Reconstruction (IABR) and Delayed Autologous Breast Reconstruction (DABR).

Eligibility Criteria:

Inclusion criteria included female patients aged 18-50 years with a BMI of 18-30 kg/m², diagnosed with early or locally advanced breast malignancy, with or without neoadjuvant chemotherapy, and with supportive family and social environments. Exclusion criteria included patients over 50 years old, BMI over 35 kg/m², metastatic breast cancer, history of previous breast surgery or recurrence, chest wall deformity, autoimmune vascular diseases and pregnancy.

Patient Selection And Allocation:

A total of 90 cases were enrolled after meeting the eligibility criteria and providing written informed consent. Sociodemographic and clinical data were collected, and comprehensive medical history and general examinations were performed. Baseline haematological, biochemical, and radiological assessments, including MRI, sonography, and mammography, were conducted. Patients were then randomly assigned to one of two groups.

Group I: Immediate Autologous Breast Reconstruction (IABR) This group comprised 45 patients who underwent breast reconstruction within 18 hours of mastectomy. Among them, 22 patients received post-mastectomy radiotherapy. Latissimus Dorsi (LD) flap reconstruction was performed in 12 patients, while 10 underwent Transverse Rectus Abdominis Muscle (TRAM) flap surgery. For the remaining 23 patients without radiotherapy, 18 underwent LD flap reconstruction, and 5 underwent TRAM flap surgery.

Group II: Delayed Autologous Breast Reconstruction (DABR)

This group included 45 patients who underwent reconstruction 3 to 6 months post-mastectomy. Of these, 23 patients received post-mastectomy radiotherapy, with 18 undergoing LD flap surgery and 5 undergoing TRAM flap surgery. Among the 22 patients without radiotherapy, 12 underwent LD flap reconstruction, and 10 underwent TRAM flap surgery.

Both surgical procedures were performed under the expert guidance of plastic surgeons, following ethical guidelines. All patients were monitored postoperatively for complications, outcomes, and overall health impacts.

Statistical Analysis:

Statistical analysis was performed using SPSS software, evaluating

patient satisfaction, complication rates, and overall health impacts. Comparisons between the two groups were made using chi-square tests and t-tests.

RESULTS

Table 1: Distribution Of Age, Stage, And Surgery In Early Vs. Delayed Reconstruction

Category	Early		Delayed	
	(N)	(%)	(N)	(%)
Age (Years)				
40-45	15	33.33	17	37.78
46-50	30	66.67	28	62.22
Stage				
IIA	14	31.11	0	0.00
IIB	12	26.66	0	0.00
IIC	10	22.22	8	17.77
IIIA	5	11.11	16	35.55
IIIC	4	8.88	21	46.66
MRM Surgery	45	100.00	45	100.00

This table shows that patients in the delayed reconstruction group had a higher incidence of advanced-stage disease (Stage IIIA and IIIC), while early-stage disease (IIA, IIB) was more frequent in the early reconstruction group. Both groups had all patients undergo Modified Radical Mastectomy(MRM) after Neoadjuvant chemotherapy, with similar age distributions between the two groups.

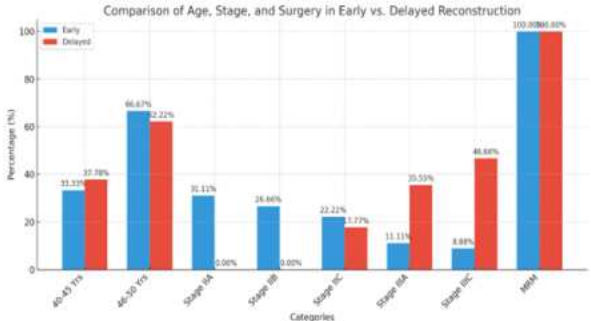
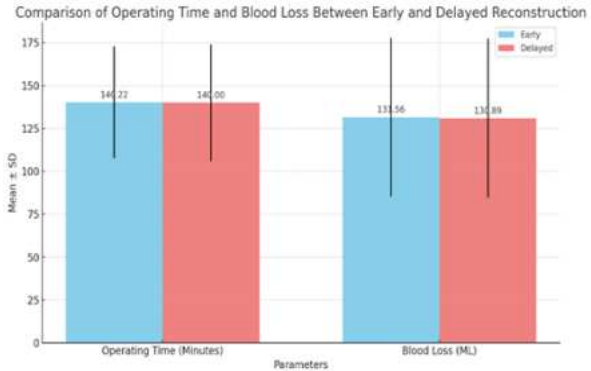


Table 2: Comparison Of Operating Time And Blood Loss Between Early And Delayed Autologous Breast Reconstruction

Group	N	Mean	SD	t-value	p-value
Operation Time (Minutes)					
Early	45	140.22	32.65	-0.031	0.9751
Delayed	45	140.00	33.98		
Blood Loss (ML)					
Early	45	131.56	46.22	-0.078	0.9377
Delayed	45	130.89	46.36		

The table represents the comparison of operating time and blood loss between early and delayed autologous breast reconstruction. Both parameters showed no significant difference between the two groups, as indicated by the p-values above 0.9, suggesting similar outcomes in terms of operative measures.



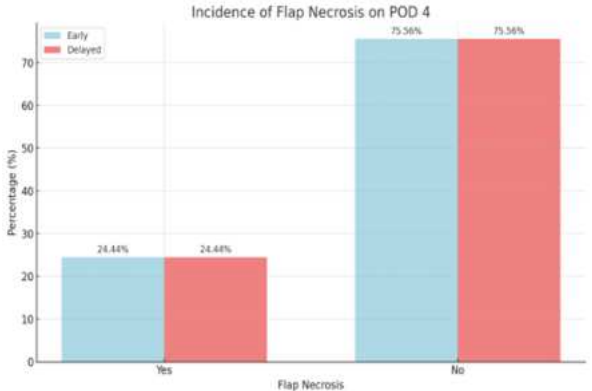
Operative Complications

Table 3: Incidence Of Flap Necrosis On Post-operative Day 4 In Early Vs. Delayed Reconstruction

	Early		Delayed	
	No.	%	No.	%
Yes	11	24.44	11	24.44

No	34	75.56	34	75.56
Total	45	100.00	45	100.00

This table represents the incidence of flap necrosis on Post-Operative Day 4 for both early and delayed autologous breast reconstruction. The results indicate identical rates of flap necrosis in both groups, with 24.44% of patients experiencing necrosis and 75.56% showing no incidence of flap necrosis in either group.

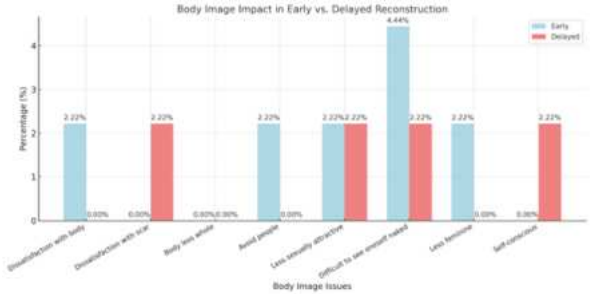


Patient Body Image Impact

Table 4: Body Image Impact In Early Vs. Delayed Autologous Breast Reconstruction

	Early (N=45)		Delayed(N=45)	
	No.	%	No.	%
Dissatisfaction with body	1	2.22	0	0.00
Dissatisfaction with scar	0	0.00	1	2.22
Body less whole	0	0.00	0	0.00
Avoid people	1	2.22	0	0.00
Less sexuality attractive	1	2.22	1	2.22
Difficult to see oneself naked	2	4.44	1	2.22
Less feminine	1	2.22	0	0.00
Self-conscious	0	0.00	1	2.22

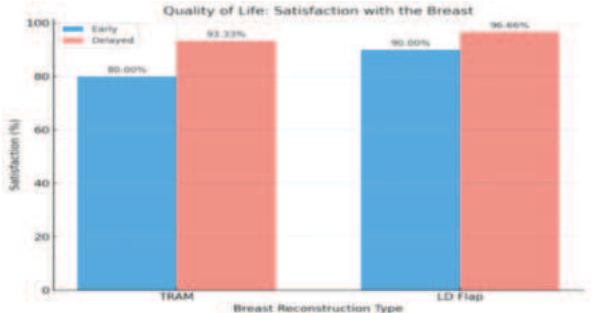
This table compares the body image issues between early and delayed autologous breast reconstruction patients. The data suggests that issues like "difficult to see oneself naked" were more prevalent in the early group, while dissatisfaction with scars and being self-conscious were slightly higher in the delayed group. Both groups reported similar percentages for feeling less sexually attractive.



Quality Of Life

Table 5: Satisfaction With The Breast In Early Vs. Delayed Reconstruction

	Early		Delayed	
	No.	%	No.	%
TRAM (N=15)	12	80.00	14	93.33
LD=FLAP (N=30)	27	90.00	29	96.66



The table represents patient satisfaction with breast reconstruction types (TRAM and LD Flap) in both early and delayed groups. The results show higher satisfaction rates in the delayed group for both TRAM (93.33%) and LD Flap (96.66%) compared to the early group, which had satisfaction rates of 80% and 90% respectively.



This Figure Shows A Marking Line For LD Flap Reconstruction.



This Figure Shows LD Flap Reconstruction

Table 6: Complication Rates and Short-Term/Long-Term Outcomes

Comorbidities	Early		Delayed	
	No.	%	No.	%
No Comorbidities	24	53.33	25	55.56
Diabetes	9	20.00	10	22.22
Hypertension	11	24.44	10	22.22
Hyperthyroidism	1	2.22	0	0.00
Total	45	100.00	45	100.00

Chi-square value=0.1.121
p-value=0.772

This table represents the distribution of comorbidities between early and delayed autologous breast reconstruction groups. The data reveals

that both groups had similar percentages of comorbidities, with no significant differences, as reflected in the p-value of 0.772.

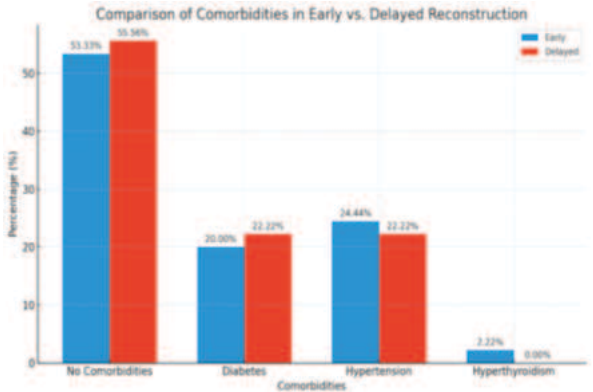


Table 7: Comparison of Outcome Measures in Early vs. Delayed Autologous Breast Reconstruction

Group	N	Mean	SD	t-value	p-value
Drain Removed (Days)					
Early	45	8.38	1.77	-1.142	0.2567
Delayed	45	7.96	1.72		
Total Drain Output (ML)					
Early	45	689.78	228.78	-0.322	0.7480
Delayed	45	674.22	229.24		
Hospital Stay (Days)					
Early	45	10.38	2.22	-0.0832	0.4075
Delayed	45	10.00	2.11		

This table represents key post-operative outcome measures between early and delayed autologous breast reconstruction groups. The results indicate no significant differences between the groups for drain removal time, total drain output, or hospital stay, with p-values above 0.2, suggesting similar recovery patterns.

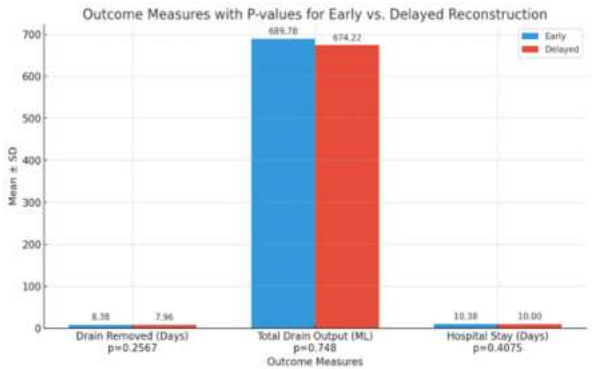
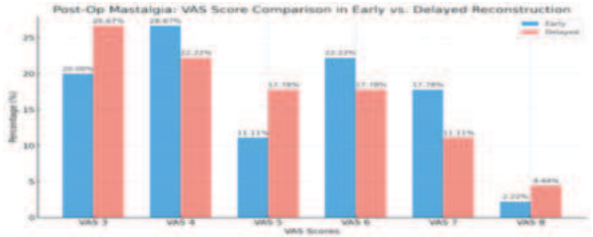


Table 8: POST OP Mastalgia - VASS SCORE

VAS SCORE	Early		Delayed	
	No.	%	No.	%
3	9	20.00	12	26.67
4	12	26.67	10	22.22
5	5	11.11	8	17.78
6	10	22.22	8	17.78
7	8	17.78	5	11.11
8	1	2.22	2	4.44

The table compares post-operative mastalgia VAS scores between early and delayed reconstruction groups. The results show a similar distribution of pain scores, with slightly higher VAS 3 and VAS 8 scores in the delayed group, while the early group had higher percentages at VAS 4 and VAS 6.



DISCUSSION

The decision to perform immediate or delayed breast reconstruction after mastectomy depends on several factors, such as the need for radiation therapy and the patient's overall health. Immediate reconstruction, typically performed during mastectomy, is recommended for patients with a lower likelihood of requiring post-operative radiation. However, predicting the need for radiation accurately can be difficult, and in cases where radiation is likely, delayed reconstruction is often preferred. Studies have confirmed that immediate reconstruction, even in cases of advanced disease, is oncological safe and provides superior cosmetic outcomes by preserving the breast envelope and using well-vascularized flaps to aid tissue healing.

In this study, the majority of early reconstruction patients were aged between 46-50 years (66.67%) and delayed reconstruction patients between 40-45 years (37.78%), *Wu Young et al.*⁷ reported similar mean ages for both immediate (51.6 years) and delayed (51.5 years) groups, with no significant difference ($p=0.94$). Regarding cancer stage, both studies showed a higher percentage of advanced-stage cancer in delayed reconstruction. In the present study, stages IIIA and IIIC were more prevalent in the delayed group (35.55% and 46.66%, respectively), while *Wu Young et al.*⁷ also found a higher incidence of stage IIIA (29.2%) and IIIC (5.6%) in the delayed group. Both studies demonstrate a trend toward more advanced-stage cancers opting for delayed reconstruction.

Comorbidities were also examined in this study, with hypertension less frequent in the delayed group, and diabetes equally common in both groups. These results align with *Wu Young et al.*⁷, who reported higher diabetes rates in the delayed group, while hypertension was lower in the delayed group in our study.

Post-operative outcomes were another area of focus. Although drain output and blood loss were lower in the delayed group, the differences were not statistically significant. Flap necrosis occurred equally in both groups, but patients in the early reconstruction group experienced more post-operative pain. Studies by *Schaverien MV*⁸ support these findings, with early-group patients reporting more pain. However, no significant differences in major complications, such as infections or necrosis, were observed between the groups.

Radiation therapy can affect the timing and outcome of breast reconstruction. Studies have shown that radiation can negatively impact both implant-based and autologous reconstructions, causing complications such as poor skin healing, fibrosis, and implant failure. These risks are well documented in studies by *Coroneos CJ et al.*¹⁰. Radiation can also cause complications in autologous flaps, including flap necrosis, volume loss, and contracture. Using tissue expanders before radiation may help, but it can also result in discomfort and unsatisfactory outcomes.

Delayed reconstruction allows patients more time to make informed decisions about their surgical options and provides an opportunity to address any radiation-related complications. However, the main drawback of delayed reconstruction is the psychological toll of living with breast deformity until reconstruction is complete. This can negatively impact body image and self-esteem, as noted by *Mitchell et al.*⁹. Technically, delayed reconstruction is more challenging due to the effects of radiation, often requiring additional procedures to achieve symmetry.

CONCLUSION

In conclusion, both immediate and delayed reconstructions have their advantages and challenges. Immediate reconstruction can provide better psychological outcomes, while delayed reconstruction is often necessary for patients requiring radiation. Both approaches can result in favourable long-term cosmetic outcomes, although patients should have realistic expectations, particularly if radiation therapy is part of their treatment plan.

Conflict Of Interest: The authors confirm there are no conflicts of interest.

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Consent: Written informed consent was obtained from all participants and securely archived.

Ethical Approval: The study received ethical clearance, adhering to the required institutional protocols.

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