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Original Research Article

Immediate Breast Reconstruction Following Surgery for Operable Breast Tumours: An Observational Study

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Abstract:

Introduction: Breast cancer, now the most prevalent cancer among women globally, surpasses lung cancer in incidence and mortality, particularly impacting low-income regions due to diagnostic delays and treatment access. Its burden extends beyond physical health, affecting survivors' quality of life and professional engagement. Innovations in surgical and reconstructive techniques, such as less invasive surgeries and advanced oncoplastic procedures, aim to improve aesthetic and functional outcomes, enhancing psychological well-being. This study investigates the preferred methods for immediate breast reconstruction post-mastectomy, considering individual needs and feasibility.

Method: This cross-sectional study, conducted over a year from November 2022 to October 2023 at the Department of General Surgery, Rohilkhand Medical College and Hospital, Bareilly, focuses on immediate breast reconstruction for patients with operable breast tumors. It excludes individuals with recurrent, bilateral, or metastatic breast cancer, or those with locally advanced disease. The study includes 45 patients, using a calculated sample size formula to ensure statistical reliability. Data collection involves a detailed clinical history and examination, with initial diagnostics including mammography or ultrasound based on age, and biopsy to confirm diagnosis. Pre-operative tests such as hemoglobin, complete blood count, liver function tests, and imaging like chest X-rays prepare patients for surgery, choosing between TRAM and LD flaps based on breast size and defect. Statistical analyses are conducted using SPSS version 25.0, focusing on means, standard deviations, and categorical data frequencies to assess the efficacy of surgical outcomes

Result: The study highlighted that breast reconstruction patients predominantly fell within the 31-40 age range, making up 42.2% of the sample. Diabetes (35.6%) and hypertension (28.9%) were the most frequent pre-existing conditions. Every participant presented with a breast lump, with 57.7% experiencing pain and 42.2% having nipple discharge. Clinical findings included nipple retraction and ulceration in lesser percentages. Breast cancer was diagnosed in 73.3% of cases, predominantly at advanced stages (T3N1M0 and T4bN1M0), via FNAC/TRUCUT biopsy. The Latissimus Dorsi (LD) flap was the most common surgical technique used (62.2%), while the Transverse Rectus Abdominis Myocutaneous (TRAM) flap was less frequent (26.7%). Post-surgery, wound infection was the most common complication, noted in 6.7% of cases, with lesser occurrences of flap necrosis and partial loss. Hospital stays and surgery duration were longer for TRAM flap procedures, which also presented higher rates of donor site infection and deformity compared to LD flap procedures. Additionally, seroma formation varied between procedures, with the LD flap showing a lower incidence of significant seroma compared to the TRAM flap, indicating potential benefits in post-operative recovery and complication management with the LD technique.

Conclusion: This study emphasizes the importance of early detection and personalized treatment strategies in managing breast reconstruction, especially for women aged 31-40 who are commonly affected by diabetes and hypertension. The prevalence of advanced breast cancer at diagnosis underlines the urgent need for enhanced public health measures focusing on symptom awareness and improved screening techniques. The comparative effectiveness and complications associated with Latissimus Dorsi and TRAM flap procedures highlight the necessity for meticulous surgical planning and post-operative care to optimize patient outcomes and minimize complications.

Keywords: Breast Reconstruction, Breast Tumours, Breast cancer.

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Introduction

The incidence and mortality rates of breast cancer are both on the rise worldwide, making it a significant problem for public health on a global scale. It has surpassed lung cancer as the most common form of cancer to be identified in female patients [1]. [2]. Breast cancer is the predominant type of cancer among women and is the primary contributor to cancer-related fatalities globally. [3]. There are inequalities in the rates of breast cancer survivorship, with lower survival rates in less developed regions due to delays in diagnosis and a lack of access to effective treatment [4]. The effects of breast cancer extend beyond the patient's physical health and could have negative impact over both the survivor's quality of life furthermore their ability to participate in professional activities. Additionally, Obesity is a notable determinant for breast cancer, especially in women after menopause, and is associated with inferior cancer outcomes. On a global scale, efforts are being made to address the challenges posed by breast cancer through the implementation of initiatives that place an emphasis on health promotion, prompt diagnosis, comprehensive treatment, and supportive care [5].

Cancer of the breast has made a significant contribution to Indian society [6] [7]. Surgical treatments for breast cancer can have a detrimental effect on women's mental health, specifically in regard to their body image [8].

Less than fifty percent of all women who require a mastectomy are offered breast reconstruction surgery at this time, and fewer than twenty percent of those women choose to have the procedure performed right away. [9] Breast reconstruction after mastectomy has made significant strides forward thanks to the development of oncoplastic surgery and the use of autologous breast tissue. Large postoperative breast abnormalities can now be repaired using high-quality tissues obtained through an autogenous flap procedure for the best possible results in terms of both aesthetics and functionality [10].

Before breast reconstruction techniques became available, the only option for treating breast cancer was to remove the affected breast completely and start over. The emotional and psychological suffering that the women endured as a result of the loss of their breasts was, for the most part, disregarded, which served as a constant reminder of the women's potentially fatal illness. Many people experienced feelings of depression and disfigurement, as well as a negative image of their bodies. The use of an external prosthesis to attempt to replace the missing breast was frequently insufficient. Breast reconstruction can take one of three forms: silicone implant based Autologous tissue-based, or combination of the above two. According to BR, the most common procedure involves the use of a silicone implant. Autologous BR procedures are available, and they frequently involve the use of skin, fat, and muscle tissue among a different region, such as the latissimusdorsimyocutaneous (LD) flap over the back. The transverse rectus abdominis myocutaneous (TRAM) flap is a pedicled or free flap that transfers skin, fat, and muscle from the lower abdomen to the chest wall [11].

In our modern, technologically advanced world, it is necessary to have a documented outcome in order to evaluate the advantages of employing flaps in the process of breast reconstruction. Psychological advantages have been associated with a successful breast reconstruction, potentially facilitating the patient's acceptance of breast loss. Because there are a lot of debates about whether immediate or delayed breast reconstruction surgeries are better after a modified radical mastectomy, the purpose of this study is to investigate and determine which procedures for immediate breast reconstruction are the most preferable according to individual needs and whether or not they are feasible and which are also the most beneficial both financially and cosmetically.

Material and Methods:

The prospective observational study was conducted among 45 patients who underwent breast reconstruction with either LD or TRAM flap.

Over the one-year study period from 01 November 2022 to 31 October 2023, a total of 45 patients undergoing breast reconstruction at the Department of General Surgery, Rohilkhand Medical College and Hospital, Bareilly, U.P., were included in this prospective observational study. Patients undergoing MRM were asked to choose between TRAM or LD flap procedures. These two groups were then evaluated for parameters like average duration of hospital stay, average duration of breast reconstruction, donor site morbidities, incidence of flap necrosis, incidence rate of seroma formation and aesthetic value.

Institutional Ethics committee approval was obtained from Rohilkhand Medical College and Hospital, Bareilly, U.P. Informed written consent of the

participants were taken. Patients refusing for breast reconstruction and those with recurrent breast cancer, bilateral breast cancer, Metastatic cancer and locally advanced breast cancer were excluded. A detailed clinical history and clinical examination was done in all cases presenting with breast lump. The initial investigations done included Mammography (more than 35 year), USG of breast (for less than 35year).

The diagnosis was confirmed on FNAC and Biopsy for metastatic changes. After confirmation of diagnosis pre-operative procedural investigations like Hb%, TLC, DLC, Blood urea Serum creatinine, Liver function test, ECG, Chest X-ray and viral markers was done. Procedure was chosen among TRAM and LD according to breast size and defect. Immediate breast reconstruction was done using autologous technique after MRM. Among the 45 cases 31 went for LD flap and in the remaining 14 TRAM flap was performed.

All the patients were regularly followed after surgery up upto the discharge and at regular intervals after discharge. During follow up all patients were screened for donor site infections and deformities, flap necrosis, seroma formation and patient satisfaction. After completing the operation, antibiotic ointment was applied to the incisions. The superior chest wall was dressed with a loosely applied wrap, including vaseline-gauze, which was changed 48 hours postoperatively. Subsequently, the dressing was replaced daily for 10 to 12 days. After this period, patients were advised to switch to a wireless brassiere. Closed suction drains were left in place until they consistently drained less than 30 mL for three consecutive days. Physical therapy for upper extremity strengthens and range-of-motion exercises began within the first postoperative week, typically starting 24 hours post-surgery and gradually increasing the range of motion. Postoperative complications were monitored and addressed as needed. Patients were discharged from the hospital on the 9th or 10th postoperative day, after removal of all skin sutures. At discharge, patients were scheduled for a follow-up visit two weeks later.

During the follow-up, the reconstructed breast was thoroughly examined for any deformities, aesthetic concerns compared to the normal breast, signs of local recurrence, and any infections. The donor area was also assessed for necrosis, infection, and deformities. Additionally, all cases were systematically checked for any distant metastasis. Patients were asked about their physical fitness, daily activity performance, overall health, including physical and mental well-being, and their social activities.

Statistical Analysis

The data was put into a Microsoft Excel spreadsheet, and the statistical analysis was performed using SPSS version 25.0, a statistical software. The quantitative data, consisting of numerical factors, was displayed using the mean and standard deviation. On the other hand, the qualitative data, representing categorical variables, was presented using the frequency and percentage of each category.

Results

Table 1:

Parameter	LD (31)	TRAM (13)
Duration of hospital stay	5 ±2.0 days	8 ±3.0 days
Duration of surgery	2.00±0.40	3.00±0.20
Infection	12.50%	25%
Deformity	12.50%	16%
Partial necrosis <1/3	12.50%	25%
Full necrosis >1/3	12.50%	8.33%
No significant seroma	62.50%	50%
Significant seroma	37.50%	50%
Breast cosmesis Excellent	16.12%	14.28%
Breast cosmesis Good	42%	21.42%
Breast cosmesis Fair	32.20%	35.70%
Breast cosmesis Poor	9.68%	28.60%

Surgical Procedures: The Latissimus Dorsi (LD) procedure was the most performed procedure at 68.89%, followed by Transverse Rectus Abdominis Myocutaneous (TRAM) at 31.11%.

Post-Surgical Complications: Wound infection was noted in 6.7% of cases, with flap necrosis and partial loss each occurring in 2.2% of the cases, highlighting the risks associated with surgical interventions.

Duration of Hospital Stay: Patients undergoing the TRAM flap procedure had a longer average hospital stay (8.0±3.0 days) compared to those undergoing the LD flap procedure (5 ±2.0 days), suggesting a longer recovery period associated with the TRAM flap.

Duration of Breast Reconstruction Surgery: The TRAM flap procedure had a longer average surgery time (3.00±0.20 hours) compared to the LD flap

procedure (2.00±0.40 hours), indicating that TRAM flaps are more time-consuming.

Donor Site Morbidities: The incidence of infection at the donor site was higher in patients undergoing the TRAM flap procedure (25%) compared to those with the LD flap (12.50%).

Additionally, the TRAM procedure showed a slightly higher rate of deformity (16%) than the LD procedure (12.50%), underlining the importance of managing post-surgical complications effectively.

Flap Necrosis: Partial necrosis was more common in the TRAM flap group (25%) compared to the LD flap group (12.50%). The rates of full necrosis were comparable between the TRAM (8.33%) and LD (12.50%) groups, suggesting a variance in the risk of necrosis based on the surgical technique.

Incidence Rate of Seroma Formation: There was a 50-50 split in the TRAM group between significant and no significant seroma formation, whereas the LD group had a higher proportion of patients without significant seroma (62.50%) and a lower incidence of significant seroma (37.50%), highlighting a potential advantage of the LD flap in terms of seroma management post-operation.

Intra operative and Post-operative Images of LD Flap

Figure 1: Flap Marking

Figure 2: Flap Harvest

Figure 3: Vascular Pedicle

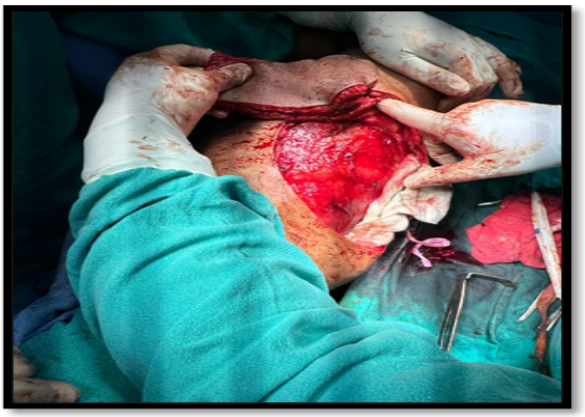

Figure 4: Create Tunneling

Figure 5: Flap Fixation

Figure 6: Donor Site

Figure 7: Post-Operative Flap Site

Figure 8: Post-Operative Donor Site

Intra operative and post-operative images of TRAM flap

Figure 9: Incision and Flap Harvest

Figure 10: Flap Transfer

Figure 11: Flap Closure

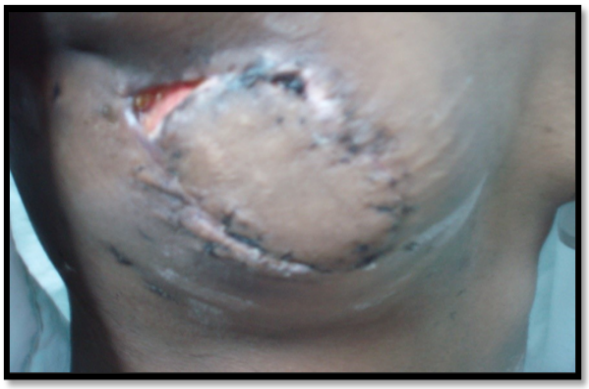

Figure 12: Post-Operative Flap Site Necrosis

Figure 13: Post-operative Donor site necrosis

Discussion

In present study, presents the frequency distribution and percentages of different surgical procedures performed, with LD (Latissimus Dorsi) having the highest frequency in 28 (62.2%), followed by TRAM (Transverse Rectus Abdominis Myocutaneous) in 12 (26.7%).

Breast cancer patients requiring surgical reconstruction have different options, including the use of autologous flaps such as LD flap and TRAM flap. Studies have compared these two techniques and their outcomes.

Different studies were found stating that the ipsilateral pedicled TRAM flap was a safe and reliable procedure for breast cancer patients with lower abdominal scars, with shorter surgical time and hospital stay compared to the contralateral pedicled TRAM flap [12].

Additionally, a comparative analysis showed that the endoscopic LD flap with fat graft technique had better overall patient satisfaction and fewer postoperative complications compared to the extended LD flap technique [13]. Patient satisfaction was also found to be associated with factors such as radiotherapy and nipple-areola complex preservation in one study [14].

In the present study, patients undergoing the TRAM flap procedure had a longer average hospital stay (8.0±3.0 days) compared to those undergoing the LD flap procedure (5.0±2.0 days), suggesting a longer recovery period associated with the TRAM flap.

Moreover, the TRAM flap procedure had a longer average surgery time (3.00±0.20 hours) compared to the LD flap procedure (2.00±0.40 hours), indicating that TRAM flaps are more time-consuming.

Research has shown that the average length of stay for patients undergoing autologous breast reconstruction procedures can be significantly reduced to less than 48 hours in appropriately selected cases [15] [16].

However, factors such as operative time have been linked to increased risks of complications and longer hospital stays in patients undergoing deep inferior epigastric perforator (DIEP) flap breast reconstructions [17].

The incidence of infection in present study at the donor site was higher in patients undergoing the TRAM flap procedure (25%) compared to those with the LD flap (12.50%).

Additionally, determinants such as specific risk factors and patient characteristics can influence the length of hospital stay and the recurrence of infection in patients with deep sternal wound infections, impacting recovery periods [18].

Therefore, the choice of flap procedure can play a role in the duration of hospital stay and recovery time for patients undergoing breast reconstruction surgeries.

Conclusion

The therapeutic approaches employed in surgical interventions, including the Latissimus Dorsi and TRAM procedures, are notable for their effectiveness, albeit they are associated with a relatively low incidence of post-surgical problems.

The findings indicate that while the LD flap procedure tends to result in shorter hospital stays, less surgery time, and potentially lower rates of significant seroma formation, both the procedures have their specific risks, such as flap necrosis and donor site complications. These differences underline the importance of individualized patient care and procedure selection in breast reconstruction surgeries.

This study highlights the necessity of implementing additional public health strategies that prioritize the early recognition of symptoms, enhanced screening methods for early detection, and the optimization of surgical and post-operative care to minimize complications. These findings suggest the need for a comprehensive approach to effectively manage breast conditions.

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