

A Comparative Study of the Outcome Measures of Reconstructive Procedure (LD/TRAM FLAPS) following Modified Radical Mastectomy for Carcinoma Breast

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ABSTRACT

Introduction: A documented outcome is needed to compare the advantages and disadvantages between LD / TRAM flaps in breast reconstruction for this modern advanced world to look for the acceptable procedure. A successful breast reconstruction (LD / TRAM flaps) may make it easier for the patient to cope with the loss of the breast and it is shown to associate with psychological benefit. The present study conducted to compare and identify the most frequent benefit and complications of the main measures (LD / TRAM-flaps) used for breast reconstruction surgery and to compare complications to the relevant independent variables.

Material and methods: The present study was conducted among 20 patients who underwent breast reconstruction with either LD or TRAM flap procedure and were evaluated for various parameters that includes duration of surgery, donor site morbidity, duration of hospital stay, incidence rate of flap necrosis, incidence rate of seroma, and aesthetic value (patient satisfaction). All the patients were followed up during post-operative regularly up to discharge and at regular intervals (after discharge at 2week, after 3 month of 1st visit and after 6 month of 2nd visit) and whenever necessary.

Results: The donor site infection rate was 18.75%, more in TRAM flap procedure and the donor site deformity was 14.58%. The seroma was developed by all patients and tendency to more seroma formation was in patients with TRAM flap procedure. Average total flap necrosis was 16.66%. Partial necrosis was more (18.75%) in TRAM flap procedure.

Conclusion: Partial necrosis and seroma formation was more in TRAM flap. Seroma was developed by all patients. More complications in case of TRAM flap procedure may be fact of long hospital stay.

Keywords: Breast Reconstruction; Complications; LD flap; TRAM flap

INTRODUCTION

Breast cancer is the leading cause of cancer death among women worldwide with approximately 1.7 million new diagnoses and 521.900 deaths in 2012. One important modality of breast cancer therapy is surgical treatment, which has become increasingly less mutilating over the last century.¹

Breast reconstruction after mastectomy gained new grounds since the introduction of autologous tissue and oncoplastic surgery techniques. Now-a-days large postoperative breast defects can be treated with high quality tissues obtained by autogenous flap surgery, to achieve the best functional and physical results.²

Before the availability of breast reconstruction techniques, treatment of breast cancer was limited to eradication of the cancer. The emotional and psychological devastation felt by the women after loss of breast was largely neglected which served as a constant reminder of their life-threatening disease. Many

experienced feelings of depression, disfigurement, and impaired body image. The external prosthesis used to replace the missing breast was often not an adequate solution. It was usually not incorporated into the woman's body image as a restored breast, and for physically active women, it could be cumbersome, uncomfortable, and easily displaced during sports and other activities.³

Mastectomy can have a significant impact on woman's body image and self-identity, including feelings of abnormality, depressive symptoms, loss of wholeness, and mourning for the lost breast.⁴ Breast reconstruction (BR) can significantly improve patient satisfaction and body image after mastectomy. Recently, it has been found that breast reconstruction is associated with decreased breast cancer mortality compared to women undergoing mastectomy only, but this is more likely to be explained by socioeconomic factors and access to health care than to oncologic factors.⁵

Three types of BR are available: with silicone implants, autologous tissue, or a combination of both. BR, using a silicone implant is the most commonly performed. Several autologous BR techniques exist, commonly including skin, fat and muscle tissue from a distant donor site, such as the latissimus dorsi myocutaneous (LD) flap from the back. The transverse rectus abdominomyocutaneous (TRAM) flap includes skin, fat and muscle from the lower abdomen which is transferred to the chest wall, and the TRAM flap is either a pedicled or a free flap requiring a smaller proportion of the abdominal muscle.⁶

A documented outcome is needed to compare the advantages and disadvantages between LD / TRAM flaps in breast reconstruction for this modern advanced world to look for the acceptable procedure. A successful breast reconstruction (LD / TRAM flaps) may make it easier for the patient to cope with the loss of the breast and it is shown to associate with psychological benefit. The present study conducted to compare and identify the most frequent benefit and complications of the main measures (LD / TRAM-flaps) used for breast reconstruction surgery and to compare complications to the relevant independent variables.

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MATERIAL AND METHODS

The present prospective observational study was conducted among 20 patients who underwent breast reconstruction with either LD or TRAM flap in the Dept. of Plastic Surgery, M G M Medical College and L S K Hospital over a duration of 18 months from January 2014 to September 2015. Patients undergoing MRM procedures were randomly allocated into two groups – TRAM flap procedure group and LD flap procedure group and were evaluated for various parameters that includes duration of surgery, donor site morbidity, duration of hospital stay, incidence rate of flap necrosis, incidence rate of seroma, and aesthetic value (patient satisfaction). Ethics approval for the study was obtained from the ethical committee of the Medical College and L S K Hospital. Informed written and verbal consent of the patient was obtained. Patients refusing to undergo breast reconstruction and those undergoing neo-adjuvant therapy were excluded from the study. Core needle biopsy from the tumor, PR/ER, HER-2-neu receptors study and cytological examination was done. The type of carcinoma was noted from the report and recorded. Mammography and ultrasonography of both breasts were done in selected cases and reports were recorded. Chest X-ray and ultrasonography of the abdomen in search of any distant metastasis were done and recorded.

Routine preoperative investigations i.e. routine hematological investigations, such as Hb%, total and differential count of WBC, fasting and postprandial blood sugar, serum urea and serum creatinine level and routine liver function test were done. Routine chest X-ray and ECG were done and recorded.

Immediate breast reconstruction using autologous technique was done after modified radical mastectomy under general anesthesia in all 20 cases. Among 12 cases out of 20, TRAM flap i.e. Transverse Rectus Abdominis Myocutaneous flap and among 8 cases LD flap i.e. Latissimus Dorsii Myocutaneous flap was performed.

All the patients were followed up during post-operative regularly up to discharge and at regular intervals (after discharge at 2 week, after 3 month of 1st visit and after 6 month of 2nd visit) and whenever necessary. During follow up all patients were assessed for donor site for infection and deformities (hernia and bending), recipient site for flap necrosis (partial <1/3rd and > 1/3rd or full thickness), seroma formation and infection, as well as patients' satisfaction (aesthetic value).

Once the operation was complete, antibiotic ointment was applied along the incisions.

The superior chest wall was wrapped with a loosely applied dressing, placing vaseline-gauze and changed 48 hours postoperatively. The dressing was then changed each day for 10 to 12 days, after which the patient was encouraged to proceed with the use of a wireless brassiere.

The closed suction drains were usually kept in place until they drain less than 30 mL 3 consecutive days. Physical therapy, for upper extremity strengthening and range-of-motion of exercises, is begun within the first postoperative week (usually started after 24 hours and gradually increases the range-of-motion of exercises). Post-operative complications were noted and treated appropriately. Patients were discharged from the hospital after cutting all the skin sutures, usually 9th or 10th post-operative day. During discharge all the patients were asked to visit after 2 weeks for 1st follow-up. The reconstructed breast was examined

properly for any deformity, esthetic appearance in comparison to the normal breast, any local recurrence and any infections. The donor area was also examined for any necrosis, infection and deformity. All the cases were examined systematically for any distant metastasis. All the patients were asked as about their physical fitness, performance of daily activities, feelings about their health, social activities and overall health i.e. physical and mental health. Second follow-up was done after 3 months of 1st follow up. Almost same procedures were used for the second visit. Third follow up visit was done after 6 months of 2nd visit and here also same procedure were used as in previous two visits.

STATISTICAL ANALYSIS

Microsoft office 2007 was used for the statistical analysis. Descriptive statistics like mean and percentages were used for the data analysis.

RESULTS

Table 1 shows comparison of outcome measures of reconstructive procedure (LD / TRAM - flaps). The average duration of breast reconstruction (Duration of surgery excluding MRM duration) for the TRAM flap procedure was 3 hours 16 minutes and for the LD flap procedure was 2 hours 25 minutes. Average days of hospital stay in case of TRAM flap procedure was more (28 days) than the LD flap procedure (21 days). The donor site infection rate was 18.75%, more in TRAM flap procedure. The donor site deformity was 14.58%, and most of the cases were of TRAM flap procedure (hernia). Average total flap necrosis was 16.66%. Partial necrosis was more (18.75%) and more in TRAM flap. The seroma was developed by all patients and tendency to more seroma formation was in patients with TRAM flap procedure.

DISCUSSION

Breast reconstruction (BR) is a basic element in the management plan in breast cancer treatment, setting a whole new range of tasks for the multidisciplinary breast cancer team. Modern oncoplastic breast surgery involves patients in the decision-making process, requiring appropriate skills, as well as personal and material conditions such as more sophisticated patient information.⁷ Breast reconstruction is assuming an increasingly important role in the treatment of breast cancer, because of the proven physical and psychological benefits for patients. This procedure favors a more rapid return of patients to their daily lifestyle, with enhanced immunity and better prognosis.⁸

In countries like India where economic and health-care performance is relatively weak, social organization and the emancipation of women are still emerging.⁷

Latissimus dorsi flap has been the very first flap to be developed, to cover post-mastectomy defects way back in 1897 by Iginio Tansini. Traditionally the latissimus dorsi myocutaneous flap (LDMF) has been used to cover a breast implant if the patient was not suitable for an implant reconstruction alone or an abdominal flap. It is based on the triangular shaped latissimus muscle and includes a patch of overlying skin and its fat tissue. Ever since the early 1980s, surgeons tried to modify the LD flap harvest in order to increase the volume of the flap and avoid the use of a breast implant.⁹ McCraw and Pepp were the first to harvest additional soft-tissue in the form of a thin layer of

Parameters	Flap procedure (Total n=20)	TRAM flap (n=12)	LD flap (n=8)
Average duration of breast reconstruction (Duration of surgery excluding MRM duration)	2 hours 48 minutes	3 hours 16 minutes	2 hours 25 minutes
Duration of hospital stay(from admission day to discharge day)	-	28 days (27.91)	21 days (21.50)
Aesthetic value (patient satisfaction)	48% (yes, satisfied)	33.33%	62.50%
Donor site morbidities			
Infection	4(18.75%)	25%	12.5%
Deformity (hernia)	3 (14.58%)	16.6%	12.5%
Flap Necrosis			
Partial necrosis (<1/3rd)	4(18.75%)	25%	12.50%
Full or > 1/3rd	2 (14.58%)	8.33%	12.50%
Incidence rate of Seroma formation			
No significant seroma (<30ml for 3 consecutive days before 10 th post operative day)	11 (56.25%)	50%	62.50%
Significant seroma (>30ml for 3 consecutive days after 10 th post operative day)	9 (43.75%)	50%	37.50%

Table-1: Outcome measures of reconstructive procedure (LD / TRAM - flaps)



Figure-1: TRAM flap procedure



Figure-2: LD flap procedure

fat on the surface of the LD muscle, the scapular muscle and the so-called supra iliac fat pad.^{9,10} The true progress in flap-based breast reconstruction occurred in 1982 when Hartrampf and colleagues used the cranially pedicled rectus abdominis muscle flap with a horizontally oriented adipocutaneous skin island (TRAM flap) supplied by the deep superior epigastric artery to anatomically reconstruct volume and shape of the breast in one

single stage without using implants.¹¹ In the present study, all patients were selected randomly but bulky breast unwilling for contralateral reduction mammoplasty were enrolled for the TRAM flap procedure whereas patients with smaller breast size and those who underwent previous abdominal surgery were selected for the LD flap procedure. Duration of operative procedure, donor site morbidities, flap necrosis and hospital stay, all these were more in

TRAM flap procedure. The patients' satisfaction was equivocal that means more than half of the patient were not satisfied. The small sample does not satisfy for proper data analysis and result. One patient in the present study, having diabetes and hypertension proceeded for delayed primary TRAM flap (inferior epigastric artery ligated 1 week earlier than MRM and TRAM flap procedure) and the patient was discharged on 20th post-operative day without any complication. This suggests that the delayed primary procedure is better than the one stage procedure but this sample size was too small to draw the results. Donor site morbidity is another potential problem of this flap. In the present study, the donor site infection rate was 18.75%, more in TRAM flap procedure and the donor site deformity was 14.58%. The seroma was developed by all patients and tendency to more seroma formation was in patients with TRAM flap procedure. Average total flap necrosis was 16.66%. Partial necrosis was more (18.75%) in TRAM flap procedure. Chang DW et al,¹² Clough KB et al,¹³ Delay E et al¹⁴ also reported seroma collection and skin necrosis of the dorsal skin flaps. Kaur N reported seroma collection in 80% cases.

To avoid this complication, it is important that primary wound closure of the donor site should be relatively tension free and the width of the skin paddle should not exceed 6 cm.⁹

Williams KJ et al¹⁵ studied the effects of radiation therapy on transverse rectus abdominis musculocutaneous (TRAM) flaps to determine complication rates and aesthetic results and reported that only the nature of the complication changes (fat necrosis to fibrosis); the complication rate does not change whether a patient receives radiation before or after her reconstruction.

A breast deformity or mastectomy for the woman who initially had lumpectomy and radiation therapy may be especially devastating because of the high priority she placed on body image when she originally selected breast-conserving treatment rather than a mastectomy. Breast reconstruction can help to alleviate this woman's sense of deformity. Reconstructive surgery in this setting, however, is medically challenging and can be more difficult because now the surgeon is working with irradiated tissues that are relatively inelastic. In this case, a flap procedure using the patient's own tissue is often the best reconstructive method.¹⁶

Breast reconstruction after mastectomy is an oncologically safe procedure that can improve psychosocial outcomes. Physician perceptions and knowledge, as well as cancer stage, also influence the rate of this procedure. Mastectomy with immediate breast reconstruction should be presented to patients with in situ or early stage breast cancer as an option along with breast-conservation therapy and mastectomy alone.⁵ The psychosocial factors including self-esteem and body image are highly related to selecting the BR option and post-BR satisfaction in female breast cancer patients.^{17,18}

CONCLUSION

Partial necrosis was more and incidence predominance in TRAM flap. Seroma was developed by all patients and tendency to more seroma formation to TRAM flap procedure. More complications in case of TRAM flap procedure may be fact of long hospital stay.

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