Panacea Journal of Medical Sciences 2023;13(1):114–119

Content available at: https://www.ipinnovative.com/open-access-journals

Panacea Journal of Medical Sciences

Journal homepage: http://www.pjms.in/

Original Research Article

Latissimus dorsi myocutaneous flap for cover of post mastectomy defects: Experience of a single surgeon in regional cancer centre Telangana, India

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ARTICLE INFO

Article history:
Received 17-07-2021
Accepted 29-12-2021
Available online 07-04-2023

Keywords:
locally advanced Breast cancer
Breast reconstruction
Latissimus dorsi flap

ABSTRACT

Background: The majority of oncological operations for breast tumors need substantial excision of locally advanced breast tumors, as well as high volume flaps for defect repair.
Aim: The function of the latissimus dorsi myocutaneous flap (LDMF) in oncoplastic replenishment of major soft tissue lesions involving the breast, as well as the rate of success and complications of the flap, were investigated in this series.
Materials and Methods: all patients in this study were operated by single faculty at a regional cancer centre in Telangana, India. During the period from 2018- may, to 2020 December. This series includes 33 cases of LDMF repair done at our center.
Results: The patients ranged in age from 30 to 70 years old, with a 6-month follow-up period. The main problem was immediately repaired in all of the patients. In our group of 33 patients, the flap had healed mainly without flap congestion in 27 of them. Wound infection with skin bride necrosis in one patient, flap marginal necrosis in four cases, and seroma development at the defect location in four patients were all mild postoperative problems.
Conclusion: In autologous reconstruction, LDMF can offer tissue volume as well as a stable vascular pedicle. When compared to the TRAM flap, DIEP flap, and other breast reconstructive methods, the percentage of postoperative problems is acceptable. LDMF should be used more frequently since it is a technically simple technique that gives appropriate coverage of a wide range of abnormalities, acceptable aesthetic results, and few postoperative problems.

1. Introduction

The basic goal of breast cancer treatment is to remove the tumor and provide any required adjuvant therapy.[1,2] Surgery is generally the first step in the therapeutic process. Big chest wall defects commonly arise from surgical ablation of locally advanced breast cancer, and repair of these large chest wall defects is a difficult clinical challenge. Various surgical methods, such as skin transplants, local skin or fasciocutaneous flaps, and myocutaneous flaps, have been used during the previous four decades (such as lattissmus dorsi pectoralis major, rectus abdominis, and external oblique flaps).[1,2] In general, flaps outperform skin grafts in terms of aesthetics and durability when adjuvant radiation is used.[3–5] Tansini was the first to describe the method of utilizing the Latissmus Dorsi myocutaneous flap (LDMF) to close defects in oncologic breast surgery.[6] Olivari is credited with popularizing it.[2] The LD flap surgery was the first to employ autologous tissue for surgical breast reconstruction. LDMF was utilized to cover chest wall abnormalities in 33 individuals over the course of two and a half years in this research. The goal of this study was

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https://doi.org/10.18231/j.pjms.2023.024

to document our experience with this flap for chest wall reconstruction, focusing on results, benefits, drawbacks, and problems. We looked at the results of utilizing LDMF for oncoplastic resectional soft tissue abnormalities in the breast in this series.[7,8]

Breast reconstruction after mastectomy is an essential part of breast cancer rehabilitation, and the UK's National Institute for Health and Clinical Excellence (NICE) advises that reconstruction be offered to all women with breast cancer at the time of their first surgery. Breast reconstruction can be done at the same time as the mastectomy (immediate) or after the patient has fully healed from the mastectomy (delayed). Breast reconstruction with autologous tissue transfer is a common procedure.[9,10]

The advantages of LDMF include the availability of a large volume of tissue and the use of a Latissimus dorsi myocutaneous flap to address soft tissue abnormalities. A regional cancer hospital in North East India has great experience with pedicled flaps, with low donor site morbidity.

2. Materials and Methods

The study was conducted in Department of plastic Surgery at a regional cancer center. During the period from May 2018-december 2020, 33 cases of LDMF reconstruction were performed in our centerall cases done by single faculty were included

2.1. Inclusion criteria

The study included individuals with significant chest wall abnormalities caused by locally advanced breast cancer t3 and t4 tumors.

2.2. Exclusion criteria

Breast reconstructions with primary closure and thoraco-abdominal flaps were not included in the study.

2.3. Surgical technique

2.3.1. Muscle anatomy

The Latissimus Dorsi is the largest of the back muscles, with various sources including the spinous processes of T7 through T12, the thoracolumbar fascia, and the posterior part of the iliac crest. Muscle slips can also be found in the lower four ribs, the external oblique, and the scapula. It is somewhat covered by trapezius super medially, but it is the most superficial muscle in the back, resting directly on the paraspinous muscles medially and the serratus anterior more laterally. The muscle's wide flat belly becomes thinner inferiorly and thickens as it converges into a single broad tendon that wraps laterally over teres major to produce the posterior axillary fold and inserts medially into the humerus' intertubercular groove. The muscle flap can be as huge as 20 x 35 cm when fully harvested, with a skin paddle as large as 12 x 20 cm.

2.3.2. Vascular anatomy

The latissimus is a type V muscle with a vascular architecture that is nearly identical to the pectoralis flap. The thoracodorsal artery, a terminal branch of the subscapular artery that originates from the third part of the axillary artery, is the main pedicle.

Anatomic variations of the subscapular axis are widely documented and frequent, and the thoracodorsal artery originates straight from the axillary artery in 2 to 5% of instances. Before the thoracodorsal artery enters the latissimus, it gives birth to many 1- to 2-mm branches that feed the serratus anterior in the majority of instances. The primary pedicle separates into two main branches after entering the muscle's underside: an upper horizontal branch that travels medially along the superior border of the muscle, and a descending oblique branch that runs inferiorly, parallel to the muscle's anterior border 2.5 cm from the edge. The muscle bifurcates approximately 4 cm distal to the inferior scapular boundary and 2.5 cm medial to the lateral free edge. Secondary pedicles develop dorsally and mostly perfuse the muscle's distal portion. They are usually located 5 to 10 cm lateral to the spinous processes, and are divided into two rows: a medial row (lumbar artery branches) and a lateral row (lumbar artery branches) (branches of the intercostal arteries). The branches of the 8th to 11th intercostal arteries are the biggest and most consistent of them.

The lateral decubitus position, with the arm prepared and the shoulder flexed to 90 degrees, is ideal for harvesting latissimus dorsi (LD) flaps.

McCraw's Harvest method was followed. The iliac crest, the superior and lateral margins of the muscle, the spine, and the inferior tip of the scapula are all indicated.

The axis of the thoracodorsal pedicle is marked 2cm below the pectoral humero grove to the posterior iliac crest .the pectoral humeral groove forms the arc of rotation.

2.3.3. Skin paddle design

A template is utilized to translate the form of the defect onto the skin overlaying the latissimus and construct a skin paddle at a comparable distance from the pectorohumeral point. It may be easier to make the initial incision independently, along the anterior border of the latissimus, in the posterior axillary fold, and locate the pedicle proximally before incising around the skin paddle, depending on the design of the skin paddle. The skin paddle incision, on the other hand, is frequently the only skin incision necessary. The subcutaneous dissection proceeds posteriorly to the midline, inferiorly to the iliac crest, then superiorly till the muscle's top border is found. The anterior free border of the muscle is where the sub muscular dissection begins.

The muscle is raised off the underlying serratus, with care made to maintain the serratus's vascular branches, and the dissection proceeds as far posteriorly and inferiorly as the subcutaneous dissection. The secondary pedicles of the muscle are found along the bottom four ribs and are ligated. The muscle is then reflected upwardly, allowing dissection to proceed superiorly, separating it from the trapezius and finding the pedicle, which can be seen entering the underside of the muscle 10 cm distal to the humeral insertion. Yang et al.[8] suggest dividing the serratus branches to extend the arc of rotation, or include the serratus in the dissection if a bigger flap is necessary. The flap is transferred through a subcutaneous tunnel created between the defect and the axilla.

2.3.4. Postoperative care

At the conclusion of the operation, antibiotic ointment and standard dressings are applied to the recipient site and the donor site.

Patients will have two back drains if donor site is closed primarily and one to two drains at recipient site. Appropriate antiembolic prophylaxis is utilized, and early ambulation with aggressive pulmonary toilet is encouraged. Length of hospitalization is on average 12 days to 14 days depending on flap condition and donor site closure and patients can expect to return to normal work function from 3–6 weeks. Suction drains will remain in place until output is <30 mL/day.

2.3.5. Recipient site

A loose circumferential dressing or surgical bra may be used with placement of axillary gauze for padding however care should be taken to avoid any direct compression over the vessels in the axilla. Dressings are removed in 24–48 h. The skin clips or sutures must be left in place for a minimum of 14 days. or a free flap, where both arterial and venous thrombosis will be monitored.

2.3.6. Donor site

Bolster dressings are done over the donor site which is covered with meshed graft and patients are advised not to lie on this side for 14 days to prevent shearing of graft. The skin clips or sutures are removed after 14 days. The very first dressing It is done on the fifth post-operative day, and the dressings are replaced every fifth day following that. The wound is kept open for 14 days and rubbed with coconut oil.

3. Results

Records of 33 patients who underwent chest wall reconstruction at our institution from May 2018 to 2020 December were reviewed. Patients' demographic data (gender, age, pathologic diagnosis, oncologic status, and reconstructive techniques and complications) are reported in Table 1.

Results were analyzed based on , demographic data, all patients underwent immediate reconstruction. Out of 33 patients included in the study conductedall were females. The age range varied between 30 - 70 years. The tumor was stage 3 in 12 case, stage IV in 20 cases, stage IV With lung metastasis in 1 case.

The most common pathological diagnoses in this group of breast cancer were IDCC in 29 cases. Right breast involvement in 19 cases and accordingly right ldmcf was used in all these patients. The Smallest defect was 15 x 14 cm and only part of the LDMCF was used. The largest defect was 29 x 23 cm and entire ldmcf was used in rest of the patients. All most all patients underwent post of radiotherapy after 3 weeks except in patients who had complications.

Except for partial graft loss in seven patients, which was cured after a few dressings, there were no significant problems. In the present, the average hospital stay was determined to be 15 days. All of the patients in this research were monitored for a period of six months.

The method's safety has been excellent in various indications of latissimus flap. The outcome of a latissimus reconstruction is generally superb, far superior than any other technique.

Table 1: Complications in present study

Type of complications	No. of patients	Percentage
General complications		
Hematoma	3	9
Wound infection	3	9
Flap complications		
Skin necrosis	5	15
Skin bridge necrosis	1	3
Donor site morbidity		
Seroma	4	12
Hematoma	2	6
Graft loss	7	21
Hollowness at harvest site	6	18
restricted of shoulder mobility,	5	15

No further donor site morbidity, such as dorsal lumbar hernia or loss of shoulder mobility, occurred in any of our patients.

4. Discussion

Due to the advanced stage of tumor manifestation in our research, the chest wall abnormalities were quite big. Extensively large tumor resection defects need immediate reconstruction with a flap having good bulk and to withstand post-operative adjuvant chemo radiation. LDMCF has been an excellent option for reconstruction of large defects, with ease of elevation and with minimal complications.

In our study 46% (n=15) of patients were in the age group of 30-40 years. Right sided breast was commonly involved

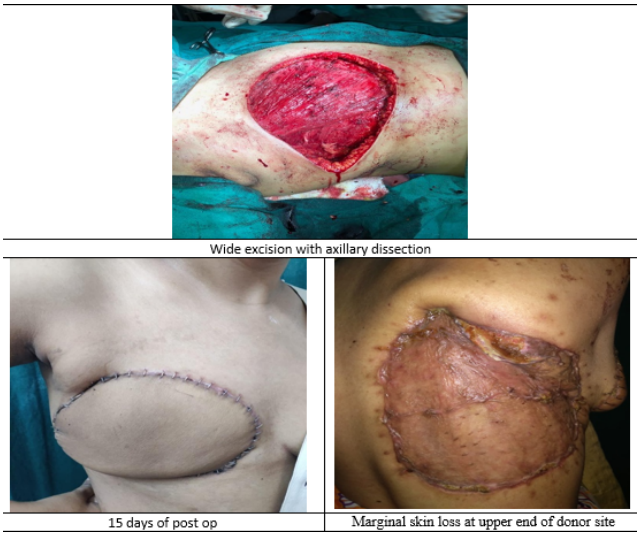

Fig. 1: Photos related to our study

in 67% (n=22) of patients and necessitating the use of right-side latissimus dorsi myocutaneous flap. The smallest size ldmf to cover the defect was 15 x 14 cm and the largest flap size was 29 x 23 approximately 667 sq.cm.

Migita Sarah Deviant et al study of Modalities for Chest Wall Reconstruction with LD in seven cases Following Cancer Ablation Latissimus dorsa (LD) flap coverage was the smallest among other types of flaps recorded, which had covered about 121.4 cm2 defect area.[11,12] However, it was the most common muscle or musculocutaneous accomplished in this study, involving 7 patients. The largest defect area, which was 300 cm2 on average.

Except for partial graft loss in seven patients, there were no significant problems in this group. All of these patients were treated with saline dressings, with one instance requiring VAC treatment. Abdalla et al. found a high rate of skin flap necrosis in up to 12% of patients and wound infection in 4% of those in their study. Only one patient in our series got an infection.[13] Achoo et al. found that in 75% of their patients, a pediclemy cutaneous flap was used to fill a chest wall defect, with little post-operative problems such as seroma development.[14]

Arnold and Pairolero are recognized for doing the most chest wall reconstructions in a single institution, based on their personal experiences with 500 chest wall reconstructions conducted at the Mayo Clinic over an 18-year span. A total of 611 muscle flaps were performed on 417 patients, including 355 pectoralis majors, 141 Latissimus Dorsi, and 115 additional flaps such as rectus abdominis, serratus anterior, and external oblique flaps.[15]

The patients' abnormalities were caused by chest wall resections, infected median sternotomies, radiation-induced necrosis, or a combination of these. At the time of the last follow-up, 83 percent of patients had good outcomes, with a repaired, asymptomatic chest wall (average follow-up 57 months). Their experience shows that doing muscle flap reconstructions in individuals with substantial comorbidities is feasible, effective, and safe.

Aashish Rajesh et al described a case of ulcerated phylloides that was treated with a major resection of the chest wall and reconstructed with a composite mesh (inner PTFE and outside vypro), pedicled latissimus dorsi flap, and split skin graft for the recurring malignant tumor. In this present study we had 4 cases of malignant phyllodes all patients underwent wide local excision and LDMCF with no history of recurrence I 6 months follow up. In this present study 4 cases of phyllodes were operated with wide local excision followed by immediate cove r with LDMCF.

In a study of Malignant phylliodes Tumors, immediate reconstruction of the breast was accomplished in thirty patients utilizing LD flap and silicon implant in one, and two patients underwent reduction mammoplasty pattern broad excision of the tumor. The operative time was approximately 120 min to 150 minutes for total reconstruction of flap in all the cases. Our timing of the flap and other findings are on par with Talukdar A et al.[16]

In a study of 123 individuals, Kapil H et al discovered that 87 percent of infiltrating carcinomas were found. Medullary carcinoma accounts for 8.13 percent of all medullary carcinomas. Infiltrating lobular carcinoma was found in 4.88 percent of the cases.[17] According to the FNAC report, the most common kind of breast cancer in our research was infiltrating duct carcinoma (IDC), which was followed by lobular carcinoma (3.33 percent). As a result, the proportion of IDC in the FNAC report was substantially greater. Infiltrating duct carcinoma is more prevalent than infiltrating duct carcinoma, according to previous studies. IDCC was found in 84 percent of the patients, phylloides in 12 percent, and lobular carcinoma in 3% of the cases in our analysis of 33 cases.

In our study all patients were with advanced disease and all resected tumors were reconstructed with immediate LDMCF cover. Reuben et al found that younger white patients seeking medical care in an urban vs rural hospital were more likely to undergo rapid reconstruction. These patients were also more likely to have a higher level of education, be working, and be married. However, there has been a significant increase in the number of older patients undergoing breast reconstruction, which is likely due to increased knowledge and changes in provider bias. Patients who did not have rapid reconstruction were more likely to be older, have numerous comorbidities, and be treated in a nonteaching hospital.[18]

The most common complication in our study was partial graft loss over donor site in 25% of caases.it was due to seroma formation and also poor graft take over fat of buttock. There was no mortality in any of our cases. A study of 30 cases of post-mastectomy breast reconstruction

using an autologous latissimus dorsi flap. According to a research by Shipra Singla, Vikas Kakkar, and Rana Ranjit Singh, the most prevalent complication after LD flap breast reconstruction is seroma development (50%) followed by wound infection and flap necrosis (25%) each, although flap necrosis >20% was not identified in any case. In any event, there was no mortality. [19]

5. Conclusion

Autologous LD flap has proven to be one of the most reliable and versatile methods of BR. The esthetic results from totally autologous LD reconstructions are superior to reconstruction with implants due to their more natural appearance, consistency and durability.

The mechanical components of growing, elevating, and harvesting the LD flap are simple and clear to express with minimum experience. The vascular pedicle is reliable, there is typically no need for a microsurgical anastomosis, and there is no long-term functional loss associated with the use of the LD muscle. The LDMF flap is a simple to raise flap with a wide arc of rotation that may be customized to big faults. The lengthy vascular pedicle allows for more pedicled flaps with less donor site morbidity. Postoperative external beam radiation can be begun after 3 weeks due to sufficient skin covering and appropriate oncological margins, resulting in satisfactory locoregional control.

Autologous tissue can also withstand RT better. Although RT may cause some reduction in the volume of the upper pole, the overall cosmetic outcome remains acceptable enough to advocate the autologous LD for IBR. Functional impairment after LD flap harvest is also minimal and compares favorably with the morbidity caused by pedicled or free TRAM flaps. There is a clinically significant reduction in function for up to 3 months, but the recovery plateaus after 6 months and the long-term function is normal in most patients. As a result, it is stated that LDF should be used more frequently because it is a durable, dependable flap with constant vascular architecture, adaptability to cover tiny or big defects, low post-operative problems, and its volume aids in enduring rapid radiation.

6. Source of Funding

None.

7. Conflict of Interest

None.

8. Acknowledgements

We are thankful to our surgical oncology HODS, associate and assistant professors and PGs, plastic surgery PGs who assisted means followed the cases long with me and hospital staff who provided expertise that greatly assisted the research.

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Cite this article: Gurram R, Bora AK, Khan TM. Latissimus dorsi myocutaneous flap for cover of post mastectomy defects: Experience of a single surgeon in regional cancer centre Telangana, India. *Panacea J Med Sci* 2023;13(1):114-119.