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Research Article

Autologous Breast Reconstruction Using Latissimus Dorsi Flap after Mastectomy in Cases of Breast Cancer: Upper & Lower Egypt Mutual Experience

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Abstract

Background: Breast reconstruction after mastectomy became well accepted and it is now an essential part of the treatment for breast cancer. The Latissimus Dorsi muscular flap is a versatile flap that is gaining renewed popularity for immediate breast reconstruction.

Aims: We aimed in this study to offer our early Experience of using Latissimus Dorsi Flap in Breast Reconstruction after Mastectomy to Egyptian women in Upper Egypt with cooperation of Surgical Oncology Center, Mansoura University, Egypt.

Methods and Material: over 1 year period between January 2014 to January 2015, 15 patients underwent breast reconstruction using Latissimus Dorsi Flap, the age of patients ranging from 25 to 50 years with follow up period ranging from 6 to 12 months. Flap related complications, Donor site complications and Esthetic results were recorded.

Results: The main indication to use the flap was dorsal donor site preference by patients. Neither total nor partial flap loss was recorded; donor site morbidity was mainly due to seroma, which was treated conservatively in all patients. Another two patients suffered from wound dehiscence in immediate reconstruction and 3 cases in delayed reconstruction. Indeed, the overall patient satisfaction was very high and good in immediate reconstruction.

Conclusion: immediate breast reconstruction using Latissimus dorsi muscular flap proved to be a good option for autologous breast reconstruction with a satisfactory aesthetic result, low morbidity. Patients should be warned of the potential for seroma.

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Keywords: Breast Reconstruction; skin sparing mastectomy; Latissimus Dorsi flap; Breast parenchyma dissection; adjuvant chemotherapy

Introduction

Breast reconstruction is aimed at restoring patients' quality of life and body image after mastectomy and has increasingly become an integral part of breast cancer treatment. Multiple techniques are available, differing in characteristics such as material used, complication rates and aesthetic result. Each technique has (dis)advantages [1].

The breast reconstruction may be immediate or delayed, Immediate breast reconstruction has been shown to be oncologically safe [2]. Immediate autologous breast reconstruction yields superior esthetic results when compared with delayed breast reconstruction, it yields the most durable and natural appearing results with the greatest consistency [3,4]. Delayed reconstruction can be performed at any time from few days to years after mastectomy. It is usually considered three to six months after mastectomy, as by this time, the soft tissues will have recovered from the operative trauma. Also, adjuvant chemotherapy treatment is usually ended [5].

The Latissimus Dorsi flap is very well vascularized, versatile, safe and reliable. The procedure is suitable for high-risk patients and may be employed for immediate or delayed reconstruction, unilateral and bilateral cases [6].

Patients and Methods

Between January 2014 to January 2015, 15 patients underwent breast reconstruction using Latissimus Dorsi Flap, 11 patients underwent skin sparing mastectomy and immediate reconstruction using Latissimus Dorsi Flap, 3 in Sohag plastic surgery department using conventional LD flap and 8 patients in Mansoura oncology center using extended LD flap, 4 patients underwent delayed reconstruction using conventional Latissimus Dorsi Flap in Sohag plastic surgery department.

The study population included patients with breast cancer stage I, II and III according to American joint of cancer committee (AJCC) and other breast conditions necessitated mastectomy, Patients on chemotherapy or radiation therapy (stage III with neo-adjuvant therapy, operation after 1 month of last cycle, patients with post mastectomy adjuvant therapy, operation 6 months of last cycle).

Exclusion criteria: The following patients were excluded from the study

- Breast Cancer with distant metastasis (stage IV)
- Patients older than 70 years
- Patients with chronic debilitating diseases unfit for surgery
- Body Mass Index (BMI) >50

All patients were evaluated thoroughly Full history including her personal and demographic data as age, occupation, special habits, menstrual history and any history of medical diseases, or previous history of operations. History of chemotherapy or radiotherapy, and family history of breast cancer were evaluated.

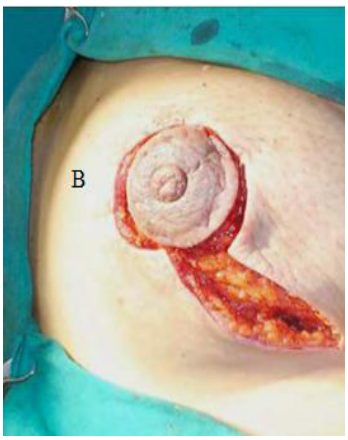
Patients were subjected to through systemic clinical examination and local breast examination. Breast examination included the affected side the breast size, scars, inflammation, presence of masses, or wounds, and the axillary lymph nodes. Local examination also included the contra lateral breast as regards to size, position, orientation, projection, and degree of ptosis, and position, size, and orientation of the NAC.

All patients underwent routine laboratory investigations, chest X ray and abdominal US. The staging process was based on carrying out routine digital mammography complemented with an ultrasound examination to both breasts and the axilla.

Histopathological examination was performed through a free hand core needle biopsy.

An informed consent was obtained all participants included in this study and they were informed about the nature, the aim of the study and the possibility of any complications.

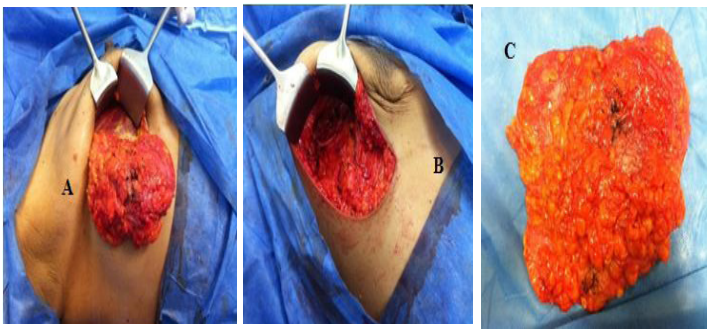
1. Peri-aereolar incision (3 mm away from areola) (Figure 1, A).



2. Peri-aereolar incision with lateral extension towards the axilla. (Figure 1, B).

3. Inverted T incision (Figure 1, C).

4. Inferior-lateral mammary crease incision (Figure 1, D).



Skin flap elevation & Breast parenchyma dissection: (Figure 2)

Figure 2: The dissection of the lower skin flap, with preservation of the inframammary fold (A), The breast bed after complete SSM & The axilla after complete axillary dissection (B), Specimen appearance after complete resection (C).

The native skin envelope flaps were dissected and elevated. The dissection plane is between the breast parenchyma and the subcutaneous fat. The dissection of the lower skin flap should not continue beyond the inframammary fold. The breast tissue is then removed off the pectoralis major muscle. Axillary dissection (level I and II) is then performed through the same incision.

II-Immediate reconstruction with LD:

Preoperative marking, a simple ellipse or a crescent shape line of cutaneous paddle was made in the posterolateral thoracic region. After incising through the skin, dissection proceeds superiorly to identify the superior border of the muscle. Medially the covering fibers of the trapezius muscle are elevated away from the underlying latissimus muscle. After identifying the superior border of the latissimus, dissection is carried superolaterally towards the axilla, separating away the fibers of the teres major muscle. Elevation of the muscle progressed in a caudal to cephalic direction till reaching to its tendon without cutting it to protect the vascular pedicle from stretching. The muscle is then tucked into the axilla and the back wound closed (Figure 3).

Figure 3: landmark and incision of LD skin paddle and dissection of the LD flap, closure of donor site.

In extended LD flap, after dissection of the thoracodorsal vessels; the upper branch of the thoracic artery is cut and ligated, while the lower branches are preserved to supply the chest wall fat over the Serratus anterior muscle (Figure 4).

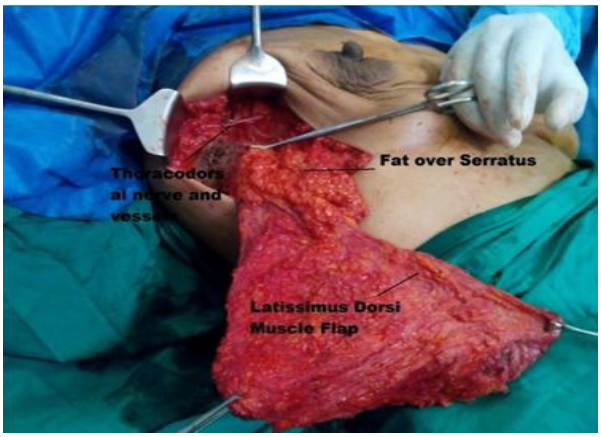


Figure 4: Ventral view of the flap with the attached fat over Serratus anterior muscle.

The vascularized fat is fixed to the pectoralis major muscle, and then the flap is folded on itself to form the second Layer of the desired reconstructed mound, and then the skin envelop is closed to yield the final view of the reconstructed breast (Figure 5).

Figure 5: Fat over Serratus fixed to breast bed, closure of skin envelop.

III- Delayed reconstruction with Latissimus Dorsi (LD) (Figure 6):

Figure 6: preoperative (A), LD and skin island marking (B), harvesting of the flap (C).

Preoperative marking of LD flap, the patient was first positioned supine with the arms in a comfortable abduction position. The old mastectomy scar was excised and the mastectomy skin flaps were dissected to recreate the mastectomy defect and the breast pocket. After the dissection of the mastectomy site was completed, the patient turned to lateral position. A simple ellipse or a crescent shape line of cutaneous paddle was made in the posterolateral thoracic region over the back roll of fat; the width was determined by a pinch technique to produce an easy closure of dorsal skin then the LD was elevated as previously described.

N	Age (years)	BMI (kg/m2)	Histopathology	Laterality	Co-morbidity	Education level/ occupation chances
1	25.0	27.0	IDC	Left side	---	High
2	27.0	28.5	IDC	Right side	Heart Disease	High
3	29.0	31.0	IDC	Left side	---	High
4	30.0	32.5	IDC	Right side	---	High
5	32.0	34.0	IDC	Left side	---	High
6	35.0	34.5	IDC	Right side	diabetes mellitus	Low
7	36.0	35.0	Phyllodes tumor	Right side	---	High
8	37.0	37.0	IDC	Left side	---	High
9	43.0	37.0	IDC	Right side	Diabetes mellitus	Low
10	48.0	32.0	IDC	Right side	---	High
11	50.0	33.0	IDC	Left side	---	Low
12	50.0	39.0	IDC	Left side	Diabetes mellitus	Low
13	40.0	36.0	IDC	Right side	Diabetes mellitus	Low
14	43.0	32.0	IDC	Left side	---	Low
15	35.0	31.0	IDC	Left side	---	High

Table 1: Demographic data.

Only 15 patients of 40 patients were recruited in this study (37.5%).

Age of the patients is ranging from 25 to 50 years, BMI ranging from 25 to 40. Pathological types revealed 14 patients with invasive duct carcinoma (IDC) and one patient with Phyllodes tumor.

The reasons for choosing the LD Flap; 11 out of 15 patients preferred the dorsal donor site. The remaining 4 patients wished to become pregnant in the Future and neither wished to be subjected to any possible donor site morbidity from a pedicled TRAM Flap with the potential for abdominal wall weakness and hence they preferred to have the LD Flap option.

Flap related complications (Table 2) in comparison between immediate and delayed reconstruction, there was no total or partial muscle Flap loss in this study (Figure 7,8,9).

Figure 7: 3 months post-operative after LD reconstruction (A), 6 months post-operative (B).

Figure 8: Intra-operative (A), immediate postoperative (B), 6 months postoperative after LD flap reconstruction (C).

Figure 9: preoperative (A), 3week postoperative after LD flap reconstruction (B, C).

Partial skin superficial necrosis in immediate conventional LD reconstruction developed in one case which undergone to debridement and left to be healed with 2nd intension (Figure 10) in delayed reconstruction developed in 2 cases, which undergone to debridement and left to be healed with 2nd intension (Figure 11).

Figure 10: pre-operative (A), 1 day postoperative (B), 3 week's postoperative (C), 6 months postoperative (D).

Figure 11: one week after wound breakdown (A, B), 3 months postoperative after wound healed by 2nd intention (C).

No major complications were developed in our cases, minor complications occurred in one case in form of infection, hematoma and dehiscence in immediate conventional LD reconstruction, 2 cases in delayed reconstruction.

Donor site morbidity (Table 2):

Complications	Immediate	Delayed
Flap related complications		0
• total muscle Flap loss	0	0
• partial muscle Flap loss	0	2
• Partial skin superficial necrosis	1	2
	1	2
• Infection	1	2
• Hematoma	1	2
• Seroma	1	2
• Wound breakdown	0	0
• Recurrence of tumor		
Donor site complications		
• Seroma	3	3
• Hematoma	1	3
• Infection	1	3
• Wound breakdown	1	3

Table 2: Flap related complications and Donor site complications.

The most common donor site problem was seroma, which occurred in 4 cases of immediate reconstruction (1 extended LD and 2 conventional LD), and 3 cases of delayed reconstruction. All patients were treated conservatively by repeated aspiration in the clinic, one patient suffered from wound breakdown and edge necrosis of the back Flaps which healed spontaneously after six weeks Following conservative Escher separation and local wound care in immediate conventional LD reconstruction and 3 cases in delayed reconstruction, 2 of them healed spontaneously after six weeks Following conservative Escher separation and local wound care, and one needed split thickness graft (Figure 12).

Figure 12: donor site ischemia and breakdown (A, B), skin graft to ischemic part after 2 months (C), 6 months postoperative (D).

Esthetic results and patient satisfaction: The aesthetic evaluations by the patients are summarized in Table 3;

Score	Immediate	Delayed
Very satisfied	6	1
Satisfied	2	1
Fairly satisfied	2	2
Not satisfied	-	1

Table 3: Patient satisfaction.

The patients with extended LD flap showing high rate of satisfaction than conventional LD in immediate reconstruction, and satisfaction higher in immediate reconstruction than delayed reconstruction, those who were fairly satisfied were those who suffered some complications that affected the breast volume, projection or symmetry with the contra lateral side.

Discussion

Breast reconstruction with autologous tissues is known to provide a much more natural, durable, Versatile and long-lasting option for patients [6].

Women who seek reconstruction tend to be younger than women who do not, as they are more likely to be well educated, affluent, and married or in a relationship [7].These outcomes agree with our results; we found that the Egyptian ladies who choose breast reconstruction are younger and had higher educational levels, occupation chances, marriage status, and higher supportive relation with partner than those who choose traditional mastectomy.

Immediate breast reconstruction yields superior esthetic results on average when compared with delayed breast reconstruction [3], as patient is already anesthetized, the defect does not have to be recreated and the patient can recover from her breast reconstruction at the same time that she is convalescing from the mastectomy. Since then, immediate breast reconstruction after mastectomy becomes more popular [2]. In addition to financial benefits as the lower overall cost of immediate reconstruction was largely due to combining the mastectomy and reconstruction into 1 operation, as opposed to having 2 separate operations, thus lowering overall operating room time and inpatient hospital days [8].

In this study, 15 cases underwent breast reconstruction, 11 cases were reconstructed immediately (73.3%), and 4 cases were reconstructed by delayed methods (26.7%). The patients satisfaction were higher in patients undergone immediate reconstruction than patients undergone delayed reconstruction, Those who were not satisfied or fairly satisfied were those who suffered some complications that affected the breast volume, projection or symmetry with the contra lateral side, this occurs in delayed cases due to effects of radiations on local tissue which make incidence of complications higher in delayed cases than immediate reconstruction.

The choice of the breast reconstruction procedure chosen individually according to following parameters: the age of the patients, the desires of the patients, the conditions of the local tissues and the donor sites, the experiences of the plastic surgeons and the facilities [1].

The reasons for choosing the LD Flap; 11 out of 15 patients preferred the dorsal donor site. The remaining 4 patients wished to become pregnant in the Future and neither wished to be subjected to any possible donor site morbidity from a pedicled TRAM Flap with the potential for abdominal wall weakness and hence they preferred to have the LD Flap option.

The Latissimus Dorsi (LD) Flap was first described in the seventies for breast reconstruction [9]. The LD flap has several important advantages. The flap is very well vascularized, versatile, safe, reliable, and has a success rate of more than 99%. The procedure is suitable for high-risk patients, including those who smoke, are obese, have diabetes, or are older. The LD flap may be employed for immediate or delayed reconstruction, unilateral and bilateral cases, cases in which an implant is not indicated or desired because of radiotherapy [6].

The standard LD flap alone often does not provide sufficient volume for breast reconstruction. In fact, it is a common practice to combine the LD flap with an implant to achieve adequate breast volume [10]. Variations of the LD flap have been described to increase the volume and avoid the addition of an implant. The first "extended" LD flap was described by Hokin and included lumbar fat extensions of the LD flap [11]. The design of an extended LD flap has further evolved to include the Para scapular and scapular "fat fascia" in addition to the lumbar fat for additional volume [16], and using Vascularized Chest Wall fat [12]. The design of an extended LD flap has further evolved to include the parascapular and scapular "fat fascia" in addition to the lumbar fat for additional volume [16], and using Vascularized Chest Wall fat [12].

Dorsal Flap necrosis is a potential problem and it has been variably reported by several authors. Chang et al. reported 16% necrosis rates in 75 patients while Delay et al. reported 3% incidence in 100 patients [10,13]. In the current report, one case developed necrosis of the edges of the Flaps in the back. This healed spontaneously after six weeks Following conservative Escher separation and local wound care. It is important that the primary wound closure of the donor site should be relatively tension- Free [10,13,14]. The optimum width of the skin paddle is hard to estimate in terms of numbers but this varies from one patient to the other and it usually lies in the range of seven to nine cm [10].

On the other hand, the LD Flap itself is a very reliable Flap with very low incidence of partial or complete necrosis [10,14]. One large study quoted complete loss of the Latissimus Flap in one of 115 patients [15], while another study reported 1% total Flap loss in a series of 100 patients [10]. Neither complete nor partial necrosis occurred in any case in this report. Necrosis usually happens when there is tension or twist on the pedicle.

Seroma in the back is the most commonly reported complication following latissimus dorsi flap dissection, which occurred in 40% in our study as compared with 50% occurred in Barnett and Gianoutsos study 1996.He stated that it has reduced significantly after leaving a back drain for 14days [14].German and Steineu

1996reported 25 %of back Seroma in their patients, which managed by multiple aspirations [16].Vasconez and Holley recommend that 2 weeks is sufficient for the drain, after that period remove the drain and leave the body dynamics to resorb the fluid [17]. In a study done by Delay 1998 utilizing LDM flap in 100 patients, the major complications were rare (1% partial necrosis and1% total necrosis). The minor complications were represented mainly with dorsal Seroma and were the main drawback of the technique and occurred in 79% of patients [13].

In our cases, Persistent Seroma after removal of negative-pressure suction drainage was treated with outpatient percutaneous aspirations and a compressive elastic bandage.

Patient satisfaction was high (66.7%), with satisfaction higher with immediate LD flap than delayed reconstruction, and higher with using extended LD than standard LD, confirming that the LD flap may provide an excellent breast reconstruction.

As regards local recurrence of the tumor in reconstructed breast, no local recurrence occurred, so reconstruction of the breast not affecting the detection or incidence of recurrence and this was also stated by Shanker2003 [18] and Salvin 1994 [19] Newman 1994 reported a 6.2%rate of local recurrence [20].

Conclusions

Skin-sparing mastectomy and immediate breast reconstruction provides a good cosmetic result with a low risk of postoperative complications. The preference of using Latissimus dorsi flap is the scare of donor site which is hidden in the back; the flap is reliable and versatile. Seroma in the back is the most commonly reported complication following Latissimus dorsi flap which can be treated conservatively. Patient satisfaction with this procedure in our series of Egyptian women was high.

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Authors Contributions

Of carried out the surgical techniques, conceived of the design of study and drafted the manuscript. EA, SR and AD participated in its design and the manuscript draft and assisted in surgical techniques. Samia M A Saied, Omar Farouk, Mohamed A Shoeib, Ahmed M K Elsherbiney performed the statistical analysis, and participated in its coordination and revised the manuscript. All authors read and approved the final manuscript.

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