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The Use Of Latissimus Dorsi Muscle And Musculocutaneous Flaps After Treatment Of Breast Cancer

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Abstract

Background: A latissimus dorsi flap technique is selected when additional tissue is needed to rebuild mastectomy defects and the TRAM flap is not available or other reasons prevent its use. The latissimus dorsi flap is also useful to supplement the skin at the mastectomy site and to provide additional muscle cover for an implant or expander when the reconstructed breast needs to be fuller and more ptotic or when the other breast is to be matched at the time of an immediate breast reconstruction. A latissimus dorsi flap provides implant cover so that the reconstructed breast has a more natural appearance. The aim of this work was to evaluate the efficacy of latissimus dorsi muscle and musculocutaneous flap in reconstruction of breast after treatment of breast cancer as regard cosmetic outcome, complications, patient satisfaction after reconstruction. Methods: This case-control study was carried out at the General Surgery Department in Benha University Hospital, was conducted on 20 female patients with breast cancer which had surgical treatment and need reconstruction. Any female patient presented with breast cancer in our study was taken regarding complete history, complete clinical examination and investigations (mammogram, breast and axillary u/s, biopsy (FNAB) and MRI of breast when indicated). This study was done from April 2019 to March 2022. Results: Regarding operative data, operative time ranged from 175 to 300 minutes with mean 233.75 minutes. Blood loss ranged from 150 to 220 ml with 188 ml. Regarding scar formation, three patients (15%) had unsatisfactory scar formation. Regarding complications, four patients had seroma (20%) and cellulitis occurred in 5%. None of the patients suffered infection, recurrence or keloid formation at the surgical site. We attribute the low number of seroma cases to quick elevation of myocutaneous flap and quick closure of the donor site, as well as tensionless closure of the donor site. All our studied patients had preserved axillary bulge. Conclusion: Latissimus dorsi myocutaneous flap plus musculocutaneous flaps is an extremely safe and reliable option for breast reconstruction. It is a simple technique with fewer complications than other reconstructive techniques, particularly for patients who fear postoperative complications and who wish to return to normal life.

Key words: Latissimus Dorsi Muscle, Musculocutaneous Flaps, Treatment, Breast Cancer**.**

1. Introduction

Today with the development of new, improved techniques to satisfy women's requests for breast reconstruction, women can choose from a number of procedures that provide the aesthetic improvement and psychological benefit that they desire. A woman's breast can now be rebuilt using implants or expanders and the tissue remaining after the mastectomy or with flaps of muscle or muscle and skin obtained from the abdomen, back, or buttock regions. The type of reconstructive technique chosen depends on a woman's physical condition, her personal preferences, and the surgeon's expertise **[1, 2]**.

A latissimus dorsi flap technique is selected when additional tissue is needed to rebuild mastectomy defects and the TRAM flap is not available or other reasons prevent its use. While some patients can have their breasts rebuilt with the back tissue without a breast implant or expander, many women do not have sufficient excess back tissue and require an implant or permanent expander implant to provide additional volume for the reconstructed breast **[1, 2]**.

In this operation skin and muscle, or sometimes only muscle, from a woman's back are transferred around to the breast area to replace the skin and muscle removed during mastectomy. This is a safe, reliable flap with a good blood supply **[3]**.

The aim of this work was to evaluate the efficacy of latissimus dorsi muscle and musculocutaneous flap in reconstruction of breast after treatment of breast cancer as regard cosmetic outcome, complications, patient satisfaction after reconstruction.

2. Patients and methods

Type of the study:

This case-control study was carried out at the General Surgery Department in Benha University Hospital from. A total of 20 female patients with breast cancer which had surgical treatment and need reconstruction were enrolled into the study.

This study was done from April 2019 to March 2022.

Target population:

All female patients with breast cancer who sought treatment and needed reconstruction with latissimus dorsi myocutaneous flap+implant at the General Surgery Department, Benha University Hospital during the study period.

Study population:

All female patients who presented to the outpatient clinic with breast cancer.

Inclusion criteria:

All female patients with:

- Given informed consent.
- Any age.

- Unilateral mastectomy.
- Immediate reconstruction.
- Not associated co-morbidity.
- Preferred dorsal donor site.

Exclusion criteria:

Any case of breast cancer with:

- Patients unable to provide informed consent to participate in trial.
- Patients unavailable for follow-up.
- Posterior thoracotomy.

Ethical considerations:

All official permission letters taken from director of the Surgery Department before start in the data collection. The study purpose and treatment were carefully explained to the patients individually. Then they were consented to participate in the study. They were allowed to ask questions freely to ensure that they had understood

Preoperative data:

Any female patient presented with breast cancer in our study was taken regarding:

- **Complete history:** Personal history including age (increasing risk of breast cancer with increasing age), nullipara or multi para (increasing risk with nullipara), menstrual history (increasing risk with early menstrual period and late menopause), special habits (as smoking increase the risk). family history (increasing risk of breast cancer, if one member of family of the patient was diagnosed with breast cancer as mother , sister or daughter), history of drug intake as contraceptive pills, or previous radiation exposure.
- **Complete clinical examination.**
- **Investigations:** Mammogram, breast and axillary u/s , biopsy (FNAB) and MRI of breast when indicated.

Surgical technique:

All procedures were performed under general anesthesia. Starting from the lateral decubitus position, the old incision scar tissue was excised and the recipient area was prepared through this incision. Skin flaps were raised, and a breast space was formed. Latissimus dorsi muscle was localized from its borders and marked between the back midline posteriorly, posterior axillary line anteriorly, iliac crest inferiorly, and the tip of scapula superiorly.

A skin island was drawn with the Pinch move depending on skin elasticity, so that the final wound scar would be hidden either on the bra line or oblique scapular line. Musculocutaneous flap was explored from the serratus muscle on the lateral side and trapezius muscle on the medial side. The flap's pedicle was dissected towards axilla, and the flap was raised with care to preserve thoracodorsal artery and vein. After creating a subcutaneous tunnel between the donor site and breast in the axillary region, the flap was transferred anteriorly to the breast region. After achieving hemostasis, a closed suction drain was placed into the donor site and the surgical field was closed with appropriate sutures.

The patient was then brought to supine position. Latissimus dorsi muscle was sewn to the rectus fascia inferiorly. An appropriately-sized implant sizer fitting into latissimus dorsi flap without excess retention was proved, and an appropriate permanent round shaped cohesive silicone gel implant was placed. A negative-pressure hemovac drain was placed into the surgical field. The muscle was sutured all around the implant, and skin and subcutaneous tissue were sutured with two-layered sutures.

Postoperative follow up:

Every week for the 1st month then every month for 6 months. Operation time, age, side, and complications were recorded. Type, size, and shape of the implant used were reported as well

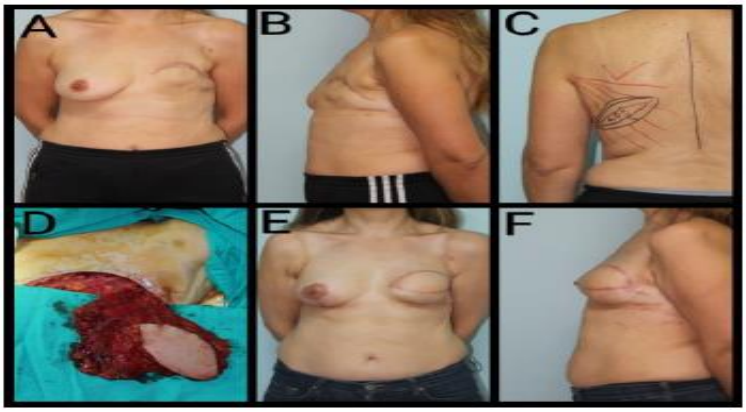

Fig. (1) A 43-year-old woman who had previously undergone total mastectomy

A: Preoperative anterior view.
B: Preoperative lateral view. The breast reconstructed with LD flap +175 cc round silicone gel implant.
C: The view of the flap design.
D: Elevation of the flap.
E: Postoperative 3 months view (anterior).
F: Postoperative 2 months view (lateral).

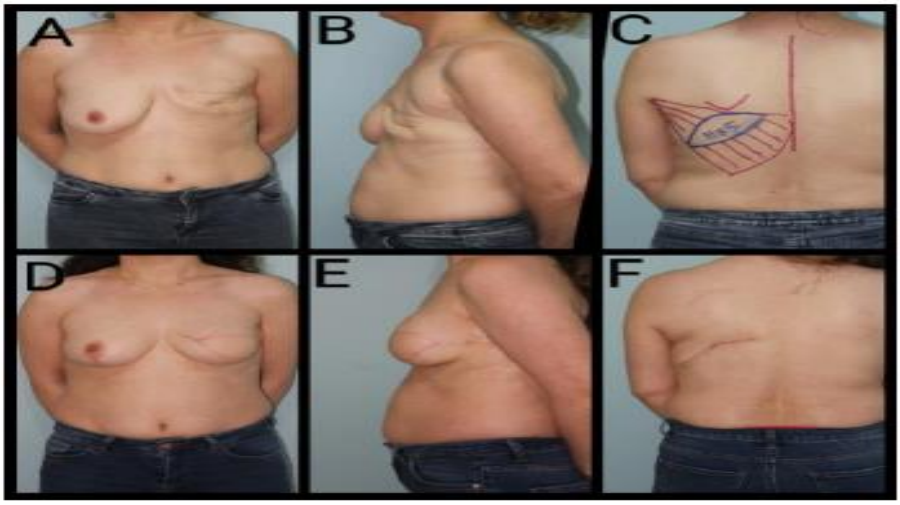

Fig. (2)A 45-year-old woman who had mastectomy for breast cancer

A: Anterior preoperative view of the patient.
B: Lateral preoperative view. The patient underwent reconstruction with left LD flap + 200 cc round silicone gel implant.
C: The design of LD flap.
D: The photograph at 6th month postoperatively (anterior view).
E: The photograph at 6th month postoperatively (lateral view) F: The view of the donor site at 6th postoperatively.

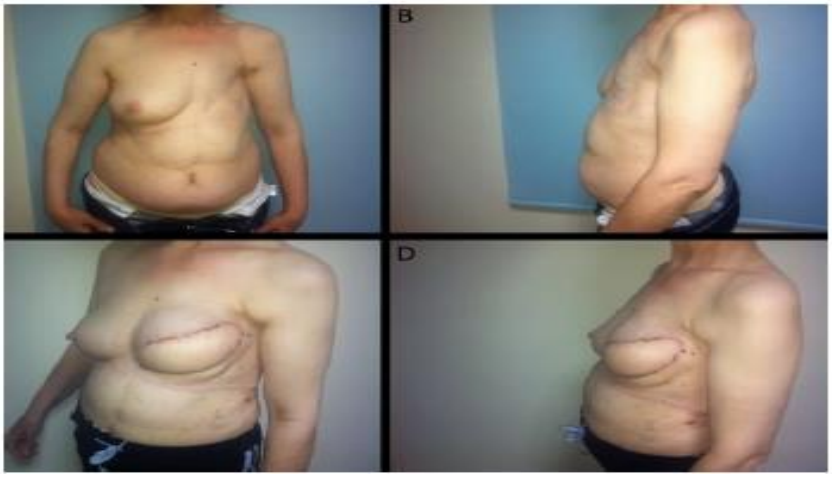

Fig. (3) 64-year-old woman who had undergone total mastectomy of the left breast 20 years ago

A: Preoperative view of the patient (anterior).
B: Preoperative view (lateral). The left breast was reconstructed with left LD flap + 300 cc round silicone gel implant.
C: The view of the patient at first month postoperatively (oblige).
D: The view of the patient at first month postoperatively (lateral).

Statistical analysis

Data were entered checked and analyzed using Epi-Info version 6 and SPP for Windows version 8 [(4)]. Data were summarized using: The arithmetic mean, The Standard Deviation (SD), Student t test, X2 (chi-squared) (test of significance). For all mentioned statistical tests done, the threshold of significance is fixed at 5% level (p-value). The results were considered:

- Significant when the probability of error is less than 5% ($p < 0.05$).
- Non-significant when the probability of error is more than 5% ($p > 0.05$).
- Highly significant when the probability of error is less than 0.1% ($p < 0.001$).

3.Results:

Table (1) Distribution of the studied patients regarding demographic data.

	N=20
Age (year)	
Mean ± SD	46.65 ± 7.24
Range	34 – 58
<44 years	9 (45%)
≥ 44 years	11 (55%)

Age of the studied patients ranged from 34 to 58 years with mean 46.65 years.

Table (2) Distribution of the studied patients regarding side of lesion.

	N=20	%
Side of lesion:		
Left	11	55
Right	9	45

This table shows that 45% of the studied patients had right sided lesion while 55% had left sided lesion.

Table (3) Distribution of the studied patients regarding operative data.

	N=20
Blood loss (ml)	
Mean ± SD	233.75 ± 53
Range	175 – 300
Operative time (min)	
Mean ± SD	188.0 ± 22.33
Range	150 – 220

Operative time ranged from 175 to 300 minutes with mean 233.75 minutes. Blood loss ranged from 150 to 220 ml with 188 ml.

Table (4): Distribution of the studied patients regarding scar formation.

	N=20	%
Scar formation		
Satisfactory	17	85
Unsatisfactory	3	15

This table shows that three patients (15%) had unsatisfactory scar formation.

Table (5) Distribution of the studied patients regarding complications.

		N=20	%
	Seroma	4	20
rly	**Cellulitis**	1	5
	Infection	0	0
	Recurrence	0	0
ate	**Keloid**	0	0

Four patients had seroma (20%) and cellulitis occurred in 5%.

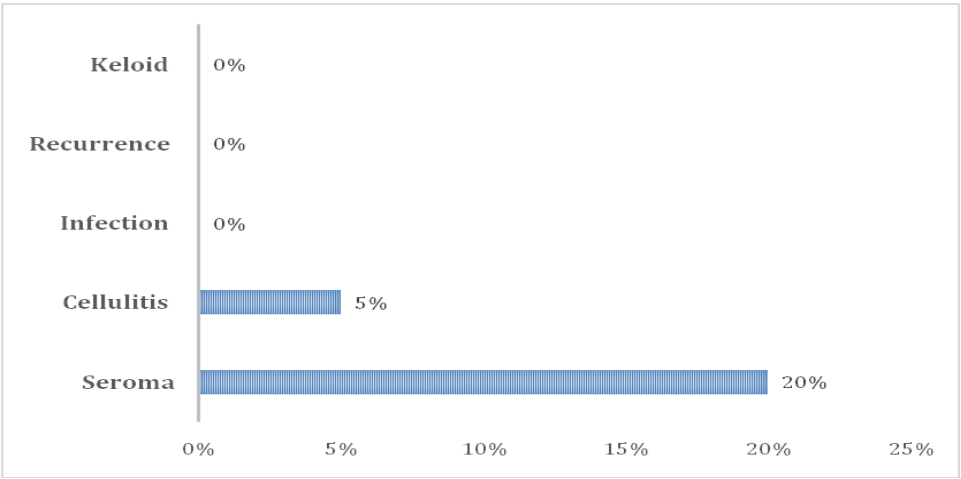

Fig. (4) Simple bar chart showing distribution of the studied patients regarding complications.

4. Discussion

Our patients were studied regarding age and side of lesion, marital status, parity and lactation. Age of the studied patients ranged from 34 to 58 years with mean 46.65 years. Also, **Baltu and Aydın [5]** investigated the aesthetic outcomes and complications of delayed breast reconstruction with latissimus dorsi myocutaneous flap + implant among patients undergoing total mastectomy operation. They performed delayed reconstruction with LD flap + implant for 24 patients and 25 total mastectomized breasts. The study population had a mean age of 44.0 years (34-58 years).

In our study, 45% of the studied patients (9 patients) had right sided lesion while 55% had left sided lesion (11 patients). Also, **Baltu and Aydın [5]** reconstructed twelve right and 13 left breasts.

Regarding operative data, operative time ranged from 175 to 300 minutes with mean 233.75 minutes. Blood loss ranged from 150 to 220 ml with 188 ml. **Baltu and Aydın [5]** found that operative time ranged between 135 and 220 minutes.

Regarding scar formation, three patients (15%) had unsatisfactory scar formation. Also, **Bailey S et al. [6]** found that only three patients had an unsatisfactory scar formation at the donor site. No patient had bad scar formation in the mammary region.

Regarding complications, four patients had seroma (20%) and cellulitis occurred in 5%. None of the patients suffered infection, recurrence or keloid formation at the surgical site. We attribute the low number of seroma cases to quick elevation of myocutaneous flap and quick closure of the donor site, as well as tensionless closure of the donor site.

Also, **Baltu and Aydın [5]** found that four patients developed seroma lasting for up to 1 month, which was improved by aspiration. One patient developed a cellulitis-like appearance on the breast tissue at the second month, which improved after a 1-week course of IV antibiotics. None of the patients suffered partial or total flap necrosis, infection, implant protrusion or rupture, hematoma, or keloid formation at the surgical site. None of the patients suffered cancer recurrence. But, **Burgić et al. [7]** reported seroma development in 19 of 20 (95%) patients and a hematoma incidence of 15%.

All our studied patients had preserved axillary bulge. Also, **Baltu and Aydın [5]** found that their patients complained of axillary bulging early in the disease course but none of them complained of bulging as they improved by 6 months. The implant of a patient was enlarged upon patient's request.

5. Conclusion

Latissimus dorsi myocutaneous flap plus musculocutaneous flaps is an extremely safe and reliable option for breast reconstruction. It is a simple technique with fewer complications than other reconstructive techniques, particularly for patients who fear postoperative complications and who wish to return to normal life.

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