

## EARLY EXPERIENCE OF AUTOLOGOUS BREAST RECONSTRUCTION AFTER MASTECTOMY : ACCEBTABILITY, COMPLICATIONS, AND OUTCOME

By

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**Introduction and aim of the work:** Breast reconstruction after mastectomy became well accepted during the past 20 years and it is now an essential part of the interdisciplinary treatment for breast cancer. We aimed in this study to offer the Egyptian women the option to obtain a nearly normal looking breast after mastectomy and to assess the complications, esthetic results and patient satisfaction.

**Patients and methods:** From January 2003 to June 2004, 12 patients were offered and accepted post mastectomy autologous breast reconstruction using either Transversus rectus abdominis myocutaneous (TRAM) or Latissimus dorsi myocutaneous (LDM) flaps. Esthetic results, complications and outcome were recorded.

**Results:** Four patients were reconstructed by pedicled TRAM flap and 8 patients were reconstructed by LDM flaps. The mean age was 46.6 year and the mean BMI was 29.8. Mean operative time for mastectomy was 77. 8 min. and the mean operative time for TRAM flap was 130 min. versus 95. 6 min. for LDM flap. Seroma in the back occurred in 3 cases in LDM flap. Partial flap necrosis and delayed wound healing each occurred in one case in TRAM flap. Esthetic results and patient's satisfaction were good in both groups except in two patients.

**Conclusion:** Breast reconstruction after mastectomy in our locality is still not gaining popularity and had low acceptability rate. Autologous breast reconstruction with TRAM or LDM flap gave good esthetic results and satisfaction in most of our patients with few complications. Proper patient selection is the key for success of this reconstructive surgery.

**Keywords:** TRAM flap, LDM flap, Modified radical mastectomy.

### INTRODUCTION

The female breast is significant on the personal level and also on family and social level as well.

Great efforts have been made in treating breast cancer by surgery, radiotherapy, and chemotherapy, similar progress has been made in the techniques of breast reconstruction and these techniques have been adapted to the modalities of oncologic therapy.<sup>(1)</sup>

The breast reconstruction is the opportunity for the woman who had cancer to refuse the morbidity and to prove to herself and to the others that she is still alive.<sup>(2)</sup>

If mastectomy is a devastating blow to a woman's feminine self concept, a threat to her sexual identity, an insult to her sense of health and well-being and a brutal reminder of her

mortality, why would anyone offered a chance to erase this terrible deformity refuse?<sup>(3)</sup>

Reconstruction of the breast after mastectomy is predominantly a demand of women in the western world and the well-developed countries. Nevertheless, in the developing countries, the women hardly demand it unless offered or motivated, the causes of these are not clearly understood.<sup>(4)</sup>

**Aim of the work:** To offer the women of upper Egypt an option to accept and obtain a nearly normal looking breast after mastectomy.

To assess the esthetic results, complications and patient satisfaction with different autologous reconstruction techniques.

## PATIENTS AND METHODS

This study was conducted during the period from January 2003 to June 2004. The study population was recruited from inpatients of general surgery and oncology departments. Many patients presented with operable breast cancer treated with modified radical mastectomy. The option of post mastectomy reconstruction was explained and offered to all patients. Patients who accepted to undergo reconstruction were operated upon with different autologous techniques. An informed consent was obtained before reconstruction. Evaluation of esthetic results, complications, and outcome were recorded.

**The study population:** Exclusion criteria: The following patients were excluded from the study:

- Age >65 years
- Body Mass Index (BMI) >40
- Severe medical disease (hypertension, DM)
- Breast cancer stage III with muscle or fascial involvement & stage IV.

**Techniques of reconstruction:** The choice of autologous flaps was individually based according to the following parameters: age, body built, and abdominal contour, in addition to patient desire.

All patients were evaluated thoroughly as regards medical history, clinical examination, previous abdominal surgery, and lastly preoperative photography.

All patients underwent immediate reconstruction after modified radical mastectomy under general anesthesia.

Special care and precaution was fulfilled during mastectomy and axillary evacuation for preservation of vessels and nerves needed in flaps reconstruction.

All patients were given 1 gm 3rd generation cephalosporin antibiotics at induction of anesthesia and continued for 3 days postoperatively and maintained if needed.

**(1) Modified TRAM flap (Marshall&Rose 1994):**<sup>(5)</sup> The flap design was marked preoperatively creating one large skin flap in a Fleur de Lys pattern on the anterior abdominal wall. The peri-umbilical skin was included to retain the peri-umbilical perforators. The flap raised in the usual way from distal to proximal end including the whole ipsilateral rectus muscle and its anterior sheath, leaving medial and lateral strips to help the fascial closure of the abdominal wall and the umbilicus is circumcised and retained. Zone IV and part of Zone III were discarded depending on the vascularity of the flap and the amount of tissue required.

A tunnel is created in the inframammary fold to the xiphoid process and the flap was inserted and molded to

give an adequate volume of tissue with approximation of the vertical and horizontal component to create a cone of tissue. Lastly, closure of the abdominal wall by suturing the lateral and medial edges of anterior rectus sheath with incorporation of the linea alba medially and aponeurosis of the internal and external oblique muscles laterally. A polypropylene mesh used as onlay graft for reinforcement of the primary closure.

**(2) Modified LDM flap (Barnett&Gianoutsos 1996)**<sup>(6)</sup> A simple ellipse or a crescentic 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.

The flap was elevated at a level of 1 cm fat for a radius of up to 5 cm, beyond this a gradual descent made through the subcutaneous to the level of the muscle at the periphery.

Elevation of the muscle progressed in a caudal to cephalic direction along a relatively avascular plain till reaching to its tendon without cutting it to protect the vascular pedicle from stretching and to preserve the dorsal nerve.

A subcutaneous tunnel was created high in the axilla, connecting the back to the mastectomy wound, through which the flap is transposed. Then the muscle was sutured to the subclavicular region of pectoral muscle and the skin closed with 3/0 prolene suture. Two closed suction drain were inserted, one beneath the muscle flap and the other in the donor site.

**Post operative follow up:** All patients were followed up after 1&2 weeks postoperatively for assessment of flap viability, seroma, wound sepsis, donor site morbidity and after 1&3 month for assessment of esthetic results, patient satisfaction and photo documentation.

## RESULTS

**Demographic data:** Only 12 out of 75 patients (16%) with operable breast cancer accept the reconstruction after mastectomy. The mean age was 46.6 year and the mean BMI was 29.8. All patients proved by histopathological study to be an invasive ductal carcinoma except one patient had phylloid tumour Table 1.

Four patients underwent reconstruction by TRAM flap and 8 patients by LDM flap.

The mean operative time for mastectomy operation was 77.8 min and the mean operative time for TRAM flap was 130 min versus 95.6 min for LDM flap. All patients with TRAM flap needs 2 units of blood Table 2.

**Post operative complications:** Table 3.

- TRAM flap patients: (4 cases)
- Delayed wound healing at the T junction in the abdomen :one case
- Partial flap necrosis : one case
- LDM flap patients: (8 cases)
- Seroma of the wound of the back: 3 cases

**Esthetic results and patient satisfaction:** TRAM flap gave good projection, ptosis and big amount of tissue. while

LDM flap gave less protection and tissue amount.

All patients except two were generally pleased and satisfied by the new breast. TRAM flap patients were also satisfied and happy by the abdominoplasty .

Satisfaction with the new breast was excellent in two patients, good in three patients, average in five patients and poor in two patients.

**Table 1. Demographic data of reconstructed patients**

No.	Age (years)	BMI	Histopathology	Staging
1	45	28	IDC	II
2	60	26	IDC	II
3	30	32	Phylloid	-
4	50	30	IDC	II
5	45	29	IDC	II
6	48	28	IDC	II
7	41	30	IDC	II
8	52	31	IDC	II
9	55	32	IDC	II
10	48	31	IDC	II
11	47	33	IDC	II
12	39	28	IDC	II

**Table 2. Operative data**

No.	Technique	Mastectomy time (min.)	Reconstruction time (min.)	Blood unite used
1	LDM	60	100	1
2	LDM	70	90	1
3	TRAM	80	140	2
4	TRAM	70	130	2
5	LDM	90	110	1
6	LDM	75	95	1
7	LDM	80	90	1
8	LDM	75	100	1
9	TRAM	80	130	2
10	LDM	90	90	1
11	TRAM	80	120	2
12	LDM	75	90	1

**Table 3. The postoperative data of the patients**

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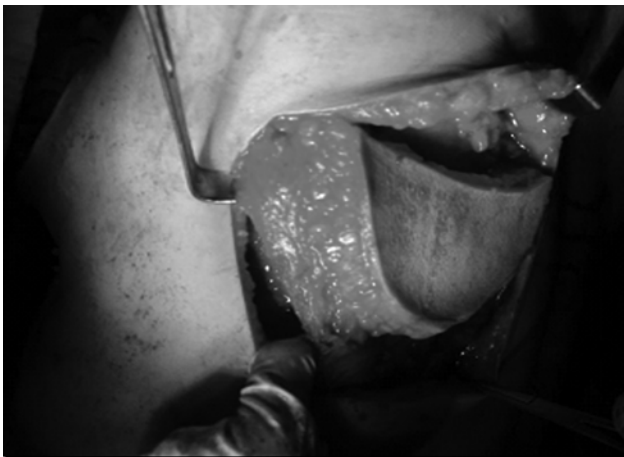
No.	Wound Seroma	Heamatoma	Infection	Partial flap necrosis	Total flap necrosis	Recurrence of tumour	Patient satisfaction
1	+	-	-	-	-	-	+
2	-	-	-	-	-	-	++
3	-	-	-	+	-	+	--
4	-	-	-	-	-	-	+++
5	+	-	+	-	-	-	+
6	-	-	-	-	-	-	++
7	-	-	-	-	-	-	+
8	-	-	-	-	-	-	--
9	-	-	-	-	-	-	+
10	+	-	-	-	-	-	+
11	-	-	-	-	-	-	++
12	-	-	-	-	-	-	+++



*Fig 1. Preoperative: Lt breast cancer with nipple retraction*



*Fig 2. Planning and creation of skin island of latissimus dorsi myocutaneous flap*



*Fig 3. Elevation of muscle flap with its skin paddle*



*Fig 4. Intraoperative after completion of the LDM flap with nipple and areola reconstruction*



*Fig 5. Immediate postoperative picture of LDM flap and nipple reconstruction*



*Fig 6. 3 months post operative picture of LDM flap*



*Fig 7. Right Mastectomy scar for delayed reconstruction*



*Fig 8. Post operative photo of same patient with TRAM flap after 12 days*



*Fig 9. Left breast cancer with nipple retraction and scar of biopsy incision*



*Fig 10. Post operative photo of same patient with LDM flap after three months*



*Fig 11. Lat view of the same patient*



*Fig 12. Preoperative photo of phylloid tumour*



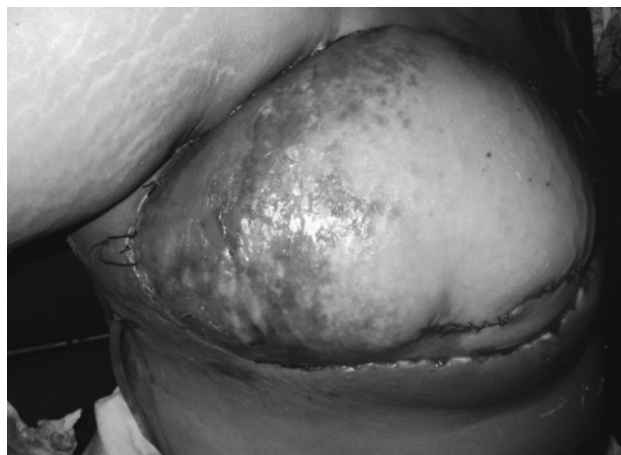
*Fig 13. Modified TRAM flap: Fleur De Lys pattern*



*Fig 14. Intraoperative mobilization of TRAM flap to the recipient site*



*Fig 15. Immediate postoperative photo of TRAM flap and abdomioplasty wound*



*Fig 16. Partial flap necrosis due to venous congestion*

## DISCUSSION

Breast reconstruction after mastectomy has become well accepted during the past 20 years and it is now an essential part of the interdisciplinary treatment for breast cancer.<sup>(2)</sup>

In our study, there is low acceptability rate of reconstruction (16%) as compared with others in the developed countries. The explanation of this may be attributed to the fear and ignorance of the patients in our community and also lack of interest with the body image and contour. An Egyptian study conducted in Ain Shams University hospital by Mostafa in 2000,<sup>(7)</sup> found that only 14% of patients accepted to undergo reconstruction. Recently in 2003 Keith<sup>(8)</sup> found that 49.6 % elected breast reconstruction.

In our work, we used autologous tissue reconstruction because the advantages of it are well known and documented including a production of a soft, warm, naturally feeling and ptosed breast. This is in agreeing with Vasconez and Holley 1995.<sup>(1)</sup>

The original design of TRAM flap was based on a contralateral rectus (unipedicle) which was complicated by partial flap necrosis, especially in Zone III & IV due to venous problems. Numerous modifications have been suggested to improve vascularity and aesthetic results but unfortunately this is not happened exceptionally led to increase the duration and complexity of the operative procedure.

We used a modified TRAM flap of Marshall&Rose1994,<sup>(4)</sup> which adds abroad vertical skin paddle extends across the midline and is continuous with the transverse component to allow well vascularized tissue above the umbilicus to be included in the flap. This improves overall blood supply and vascularity of the flap. An unsuccessful TRAM flap can cause serious inconvenience and disability.<sup>(1)</sup> Fortunately we had no major complications as flap loss or abdominal hernia, all the complications were simple and did not affect patient's satisfaction with the procedure. Partial flap necrosis occurred in one patient treated by early debridement and simple closure. Rectus flap reconstruction was well tolerated by the majority of patients if careful attention was taken to close completely the rectus donor defect and careful patient selection is essential for this autologous source.

Initially, the LDM flap was described with silicone breast implant. Modification of the flap dissection to include additional subcutaneous tissue, can now provide a reliable method of autologous reconstruction for many patients.<sup>(10)</sup> As regards LDM flap it has the advantage of its reliable vascularity, proximity to the defect, simplicity in dissection and minimal blood loss.<sup>(2)</sup> In the classic design, the pure muscle flap did not provide sufficient volume and usually

had to be combined with silicon jel implants.<sup>(11)</sup> Many attempts were done to increase the volume of the flap so produce what is called Total autologous LDM flap. The one that we used is the modification made by Barnett&Gianoutsos.<sup>(6)</sup>

Seroma of the back is a common problem in LDM flap which occurred in 37.5% in our study as compared with 50% occurred in Barnett&Gianoutsos study 1996.<sup>(6)</sup> He stated that it has reduced significantly after leaving a back drain for 14 days.

German and Steineu 1996<sup>(12)</sup> reported 25 % of back seroma in their patients, which managed by multiple aspirations. Vasconez and Holley,<sup>(1)</sup> recommend that 2 weeks is sufficient for the drain, after that period remove the drain and leave the body dynamics to resorb the fluid. In a study done by Delay 1998,<sup>(13)</sup> utilizing LDM flap in 100 patients, the major complications were rare (1% partial necrosis and 1% total necrosis). The minor complications were represented mainly with dorsal seroma and was the main drawback of the technique and occurred in 79% of patients.

Immediate breast reconstruction should not delay adjuvant chemotherapy due to recipient or donor site complications.<sup>(14)</sup> The balance between recipient site benefits and donor site deformity and morbidity must be considered, when comparing different autologous sources.<sup>(15)</sup>

As regards local recurrence of the tumour in reconstructed breast, it occurred in one case who had phylloid tumour after one month of the operation and was treated by locoregional control of radiochemotherapy, so reconstruction of the breast not affecting the detection or incidence of recurrence and this was also stated by Shanker 2003<sup>(16)</sup> and Selvin 1994.<sup>(17)</sup> Newman 1994,<sup>(18)</sup> reported a 6.2% rate of local recurrence. Zimmerman 1998,<sup>(19)</sup> found that post mastectomy irradiation of reconstructed breast by TRAM flap appears safe and cosmetically acceptable, in other hands Rogers & Allen 2002,<sup>(20)</sup> found significant higher incidence of fat necrosis, fibrosis, and flap contracture among irradiated flaps in comparison with non irradiated flaps. In our study, there is no change in irradiated breast apart from some hardness in its consistency.

Reconstruction of the nipple areola complex can be achieved by a variety of techniques and is completed at the initial stage due to the excellent circulation of this myocutaneous territory.<sup>(21)</sup> The reconstruction of the nipple and areola complex is the final step in breast reconstruction. Free grafts and local skin flaps are the two principle methods of nipple reconstruction.

In our series we used, a skin graft from the inner aspect of the thigh for areolar reconstruction, and modified Skate flap for nipple reconstruction.<sup>(22)</sup>



Autologous tissue breast reconstruction has the potential to provide excellent results, but it also, can lead to severe complications if proper patient selection was ignored.

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