

Local Tumor Control and Cosmetic Outcome in Breast Cancer after Immediate Reconstruction Using T.R.A.M. Flap and Adjuvant Therapy

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INTRODUCTION

Despite widespread mammographic screening and increasingly aggressive treatment approaches, breast cancer continues to be a leading cause of both morbidity and mortality in the aging female population [1].

Breast reconstruction is now regarded as an integral part of breast cancer management and is requested with increasing frequency by informed women at the time of mastectomy [2].

A variety of techniques have been described over the last 35 years including silicone implant (Cronin & Cerow, 1963), Latissimus dorsi flap (Muhlbauer & Olbrish, 1977), Transverse rectus abdominis flap (Hartrampf, 1982) and tissue expanders (Radovan, 1982), these technique have been modified, improved, optimizing results and reducing the complications [3].

The increase in patient expectation, earlier specialization and more comprehensive training curricula encompassing breast have coincided with a rise in patient led demand for immediate breast reconstruction (IBR) particularly in U.S.A. [4].

Meanwhile, better understanding of the benefits of immediate reconstruction is leading to a fundamental change of philosophy in Europe and U.K. [5].

Recognition of the surgical and oncological safety of immediate breast reconstruction (IBR) and appreciation of the psychological, technical

and financial advantages of this approach is encouraging its use in many breast cancer centers [6].

Immediate breast reconstruction with a transverse rectus abdominis myocutaneous flap is becoming an increasingly popular choice for women undergoing modified radical mastectomy as it making a women to awaken with intact breast in a single procedure and also does not interfere with post operative adjuvant radiation and chemo-therapy improving control of local recurrence [7].

PATIENTS AND METHODS

This study was carried upon 25 premenopausal women admitted in both general surgery department in Assiut University Hospital and Surgical Oncology Departments in South Egypt Cancer Institute in a period from November 1999 to July 2002.

Their ages ranged from 30 years to 45 years with a mean age 41.5 years. Those patients were presented with breast lumps of different sizes and sites with palpable axillary lymph nodes.

Pretreatment evaluation:

- A- Full history taking.
- B- Thorough clinical examinations.
 - General clinical examination.
 - Local breast examination.
 - Local abdominal examination.

C- Investigations:

All patients were subjected for organ function assessment, metastatic work up and staging by:

- 1- Laboratory investigations, which include (complete blood picture, blood urea, serum creatinine, blood sugar level and liver function tests).
- 2- Radiographic investigations, which include (chest X-ray, abdominal ultrasound) and CT chest or abdomen in suspected cases.
- 3- Routine surgical fitness investigations.
- 4- Preoperative biopsy.

Surgical procedures: There is a combined team of surgeons working simultaneously; the first was general surgeon doing a modified radical mastectomy and the plastic surgeon doing an immediate reconstruction by contralateral pedicled transverse rectus abdominis myocutaneous flap. The abdominal wall was reconstructed by prolene mesh with two suction drains inserted in both breast and abdominal wounds.

Postoperative care: The patient should be in a semi-setting position receiving good ventilation, broad-spectrum antibiotic and strong analgesic. Also, avoid any compression on the pedicle or hypothermia and hypovolaemia.

Suction drains: Were removed on the fifth day postoperative, also the breast stitches were removed at the seventh day and the abdominal stitches were removed from 10 to 15 days postoperatively in outpatient clinic.

Adjuvant postoperative therapy:

Chemotherapy: After complete healing of the scar in the presence of normal base-line laboratory investigations all patients received the adjuvant combination chemotherapy FAC regimen (fluorouracil 500 mg/m² i.v. d₁ doxorubicin 50 mg/m² i.v. d₁ and Cyclophosphamide 500 mg/m² i.v. d₁) with recycle every three weeks for six cycles.

Radiotherapy: All patients were planned for radiotherapy after completing six cycles of adjuvant chemotherapy by CT simulation, to insure accuracy, then received a tumor dose of 50 Gy to the chest wall through a field crossing the mid-line by 1 cm and extending to mid axillary line, as well as the supraclavicular field. The radiation was delivered through linear-accelerator

using 6 MV photon energy with application of wedges or compensating filter, to achieve a uniform dose distribution within the treatment volume. This in five weeks of treatment, five fraction per week from Saturday through Wednesday.

Follow up: The twenty-five patients were followed up monthly for a period of 24 months postoperatively by meticulous local clinical examination for the following:

- 1- Reconstructed breast for: a- Viability of the flap. b- Aesthetic appearance. c- Quality of coverage. d- Local recurrence (CT was requested on clinical suspicion). e- Effect of radiation.
- 2- Abdominal donor site: a- Infection. b- Wound dehiscence. c- Hernia or muscle weakness.

Routine metastatic work up was performed for all patients periodically every three months and patient's moral was assessed, whether they were satisfied or not.

RESULTS

This study was carried upon 25 patients presented by various breast lumps.

According to the size of the breast mass (T), the patients were classified into two groups; the majority of them were 3 to 5 cm in the largest dimensions (Table 1).

Table (1): Breast mass size.

| Tumor size | T | No. |
|------------|----------------|-----|
| 3-5 cm | T ₂ | 18 |
| 6-8 cm | T ₃ | 7 |
| Total | | 25 |

The right breast was affected in higher percentage than the left one (Table 2).

Table (2): Site of breast affected.

| Affected breast | No. | % |
|-----------------|-----|-----|
| Right breast | 15 | 60 |
| Left breast | 10 | 40 |
| Total | 25 | 100 |

Those patients were classified into 5 groups according to the affected site, the highest incidence about 56% found in the upper lateral quadrant (Table 3).

Table (3): Distribution of breast lumps within the breast.

| Affected quadrant | No. | % |
|-------------------|-----|-----|
| Upper lateral | 14 | 56 |
| Lower lateral | 6 | 24 |
| Lower medial | 3 | 12 |
| Upper medial | 0 | 0 |
| Retroareolar | 2 | 8 |
| Total | 25 | 100 |

All patients in the study had enlarged and mobile ipsilateral hard lymph nodes (N₁).

All the breast lesions (25 cases) proved histopathologically to be infiltrating duct carcinoma (IDC) and histological grade as shown in Table (4).

Table (4): Histopathological grade.

| Histological grade | No. | % |
|--------------------|-----|-----|
| Grade-2 | 16 | 64 |
| Grade-3 | 9 | 36 |
| Total | 25 | 100 |

Concerning clinical staging with T.N.M. classification, the highest incidence was in the stage 2 (80%) (Table 5).

Table (5): Show clinical staging according to TNM classification.

| Clinical staging | No. | % |
|------------------|-----|-----|
| Stage 2 | 20 | 80 |
| Stage 3 | 5 | 20 |
| Total | 25 | 100 |

Every patient was evaluated for the following:

A- Reconstructed breast status:

1- Flap survival: Complete survival of the flap occurred in all cases except two cases, who developed partial necrosis in 1/4 of the flap, however in both cases, debridement was done and direct closure.

2- Quality of coverage: There were an accepted to good coverage in all cases.

3- Aesthetic appearance of the flap: It was excellent in 23 cases (96%) and accepted in the 2 cases (8%).

4- Local recurrence: During the period of the study, there is only one case (4%) developed local recurrence.

5- Effect of radiation therapy on the flap: No major radiation complications (moist desquamation or ulcers) developed during the period of study.

B- Donor site morbidity (abdominal wound):

1- Development of hernia or muscle weakness: No case developed hernia during the period of the study, this was due to routine application of proline mesh during abdominal closure.

2- Wound dehiscence: Two cases developed wound dehiscence in the central part of the abdominal flap which responded to debridement and secondary closure and the patient underwent smooth postoperative recovery.

C- Patient moral: 20 patients (80%) satisfied by their reconstruction, 3 patients (12%) were fair and two patients (8%) were unsatisfied.

D- Operative time: This ranged from 2.5 hours to 4 hours with a mean time of 3 hours.

E- Hospital staying period: This ranged from 7 to 10 days.

Complications during the study are shown in Table (6).

Table (6): Complication in the studied cases.

| Complications | No. | % |
|-------------------------------|-----|----|
| Flap survival: | | |
| - Partial | 2 | 8 |
| - Complete | 0 | 0 |
| Recurrence | 1 | 4 |
| Major radiation complications | 0 | 0 |
| Hernia or muscle weakness | 0 | 0 |
| Wound | 2 | 8 |
| Dehiscence | | |
| Patient moral: | | |
| - Satisfied | 20 | 80 |
| - Fair | 3 | 12 |
| - Unsatisfied | 2 | 8 |

Clinical cases



Preop.



Case (I):
Early post. op.



Late post. op.



Preop.



Case (II):
Early post. op.



Late post. op.



Preop.



Case (III):
Early post. op.



Late post. op.



Preop.

Case (IV):
Early post. op.

Late post. op.

DISCUSSION

Mastectomy with immediate reconstruction has become an accepted procedure in the treatment of breast cancer and several centers have over the last few years increased the proportion of immediate reconstruction in relation to the total number of mastectomies [8].

There are many advantages to immediate vs. delayed reconstruction including:

A- Psychological benefits: Women who undergo immediate reconstruction tend to accept the new breast as an integrated part of their bodies and demonstrate reduced psychological morbidity, they have significantly less distress in recalling the surgery, are less likely to be repulsed by their own naked appearance and have more freedom to dress than women who do not have reconstruction.

B- Cosmetic benefits: The immediate reconstruction clearly yields superior cosmetic results compared with delayed reconstruction, there are two reasons for this; firstly the natural tissues that remain after mastectomy are unaffected by soft tissue contraction and scar, secondly the inframammary fold and other important landmarks that determine the unique shape of each woman's breast are preserved.

C- Reduced morbidity: In immediate reconstruction, there is lower anesthetic risk and less hospital staying because everything done in one procedure.

D- Role of adjuvant therapy: The immediate reconstruction did not interfere with adjuvant radiation or chemotherapy which could be given safely and achieving control of local recurrence with reconstruction when mastectomy is necessary [9].

There are two types of immediate reconstruction either implant placement or autologous tissue transfer, reconstruction using silicone breast implant has been the most common type of reconstruction primarily due to the ease of the procedure and the quick postoperative recovery, however in early 1992 food and drug administration passed a moratorium restricting the use of silicone implant because increasing concern of the relationship between it and connective tissue disorders, also due to the increasing incidence of capsular contracture in patients receiving postoperative radiotherapy decreasing the popularity of this implant procedure [10].

Studies looking for use of latissimus dorsi flap show that the majority of women will not have enough breast volume requiring use an implant with complications associated also leaving a big conspicuous scar in the back, for all those reasons this procedure become unreliable in breast reconstruction [11].

Immediate breast reconstruction with transverse rectus abdominis myocutaneous flap (T.R.A.M.) is becoming an increasingly popular choice for women undergoing modified radical mastectomy as it give a big volume for re-

constructed breast, with an acceptable aesthetic appearance [12].

This study was carried on 25 premenopausal females suffering from breast cancer of different stages, all of them subjected to the standard modified radical mastectomy followed by immediate reconstruction by pedicled contra lateral T.R.A.M. flap and then receiving the standard adjuvant chemotherapy and radiotherapy.

In this series, partial flap loss was found in two cases; the first one was diabetic and the second one was heavy gauza smoker, in both cases debridement was done and secondary closure. This is matched with results of Hunt et al., 1997 who worked upon 19 patients underwent T.R.A.M. flap with follow up period 38 months.

As regard local recurrence, in this series, there was only one case (4%) developed recurrence during the period of the study, which is matched with the results of Sultan 1997 study, who reconstructed 22 patients after modified radical mastectomy by T.R.A.M.P. flap and adjuvant radiotherapy.

But not matched with Slavin study 1994 who reviewed 161 patients with primarily early stage cancer breast treated with non skin sparing mastectomy and immediate T.R.A.M. reconstruction and found a local recurrence of 10.6%.

As regards the effect of radiation, there was no flap desquamation or flap loss in the present study, this is matched with Zimmerman 1998 who worked upon 21 patients, with post reconstruction radiation and found no flap losses, but not matched with Hanks et al., 2000 who worked upon 25 patients, 3 of them developed moist desquamation, he it by early application of radiation therapy just 2 weeks after reconstruction in those cases.

As regards aesthetic appearance of the flap there was an accepted cosmetic appearance of the reconstructed breast in most of our cases.

As regards muscle weakness or hernia, there was no case developed hernia during the period of the study which may be attributed to the use of only one rectus muscle and routine application of proline mesh during abdominal closure.

As regards patient satisfaction, 20 patients became satisfied from the procedure, 3 were

fair and only two patients were unsatisfied. This may be explained by the development of partial loss in these two cases which was corrected by debridement and direct closure resulting in a small sized flap.

Conclusion:

Immediate reconstruction by T.R.A.M. flap becomes an important step in management of breast cancer as regards the following:

1- It gives an amble and good quality of skin for coverage of breast wound after mastectomy.

2- It gives an excellent to fair aesthetic appearance for reconstructed breast after mastectomy.

3- The immediate reconstruction by T.R.A.M. flap does not interfere with standard and safe delivery of radiotherapy, aiming at control of local recurrence in a satisfactory body image without complications.

4- Immediate reconstruction by T.R.A.M. flap carrying all task in one step so it decreases the exposure to another operation for reconstruction later.

5- The immediate reconstruction by T.R.A.M. flap gives superior results than implant which is highly costly, also carrying many complications as extrusion, infection and capsular contracture. The T.R.A.M. flap is also superior to L.D. flap as it gives higher quality of skin and minimal donor site morbidity.

6- Immediate reconstruction by T.R.A.M. flap after mastectomy improves the patient moral as the woman can't feel that something missing from her.

7- The combined team of both plastic and general surgeons will markedly decrease the operative time and lower the anesthetic risk.

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