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ORIGINAL ARTICLE

SKIN SPARING MASTECTOMY IN LARGE TUMOR BREAST CANCER

By

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Aim: *Skin sparing mastectomy (SSM) with immediate reconstruction has been approved to be safe treatment approach for early-stage (T1 or T2) breast carcinoma. This prospective study was undertaken to assess both the feasibility and oncological safety of SSM in patients with large tumor breast cancer.*

Methods: *Twenty patients with large T2 and T3 breast cancer were included. All patients were subjected to (SSM) with immediate reconstruction with either Transverse Rectus Abdominis Myocutaneous (TRAM) flap or Latissimus Dorsi (LD) myocutaneous flap with an implant. The patients were followed up for a period ranged from 12-22 months with a mean of 14.55±2.96 months.*

Results: *The mean tumor size was 5±0.73 cm (range 4-6cm). Postoperatively, 3 cases (15%) developed necrosis of a part of their native skin flaps, one case (5%) had partial TRAM flap necrosis, and 5 cases developed seroma. All cases received postoperative chemotherapy that was initiated in a mean of 21.5±7.87 days, then radiotherapy after chemotherapy completion. Throughout the follow up period, none of the patients developed local recurrence while only one case (5%) developed distant bony metastases.*

Conclusion: *SSM is feasible and oncologically safe in large tumor breast cancer; however, longer period of follow up is required.*

Keywords: *Breast reconstruction, TRAM flap, LD flap.*

INTRODUCTION

Surgery has always been the first and foremost way of treating breast cancer. Although proper eradication of cancer is the main focus, the importance of the breast to the patient's self-image is also acknowledged.(1) It has been clearly established that breast-conserving surgery is as effective as mastectomy for curing early stage breast cancer and that it can improve the psychosocial outcome.(2) However, mastectomy is still presumed required for patients with more advanced stages. For these patients, breast reconstruction is a surgical option that is generally thought to improve the quality of life without decreasing the patients' chances of survival.(3) Breast reconstruction following conventional mastectomy often results in prominent scars on the new breast and a paddle of skin that is of a different color and texture which is usually insensate. Moreover, there is high incidence of contralateral breast adjustment in order to achieve symmetry.(4)

Skin-sparing mastectomy (SSM) was introduced in 1991 by

Toth and Lappert[5] to describe a total or radical mastectomy with maximal skin preservation. SSM is defined as removal of the nipple-areola complex, any previous biopsy scar, skin within 1 cm of tumor, and all breast tissue.[6] The maintenance of the skin envelope and inframammary crease has changed the nature of autologous breast reconstruction from that of a breast "shaping" to a breast "filling" procedure. In addition, it creates smaller scars, which can be hidden well within a periareolar location,[7] and preserves the sensate breast skin thus obviates the need to perform a more complicated sensate flap reconstruction.[8] Thus, SSM allows cosmetic results that are superior to those after conventional mastectomy techniques with immediate reconstruction,[9] and makes it easier to create breast symmetry with fewer revisions to the contralateral breast.[10] Currently, it is well established that SSM is an oncologically safe approach and an effective treatment for patients with early-stage (T1 or T2) breast carcinoma[7] However, the indications for SSM in more high risk stages of breast cancer remain undetermined and few studies have evaluated its oncological safety in this indication. Therefore, this prospective study was undertaken to assess both the feasibility and oncological safety of SSM in patients with large T2 and T3 breast cancer.

PATIENTS AND METHODS

In the period from June 2005 to August 2007, 133 cases of breast cancer were admitted at both Menoufia and Alexandria University Hospitals, from whom 20 patients with tumor size ≥ 4 cm in maximum diameter (large T2 and T3) were included in this study. Patients with early breast cancer (T1 and small T2, 4 cm), and those with T4 tumors were excluded. All patients were clearly instructed about the research design and signed informed consent before surgery. Patients were assessed preoperatively to determine their clinical staging according to 2002 edition of the AJCC Staging Manual.[11] According the national comprehensive cancer network (NCCN) guidelines,[12] neoadjvant therapy is mandatory only in locally advanced breast cancer and optional in earlier stages, so, none of our patients was scheduled in this regimen. All patients were subjected to SSM as the primary treatment through the standard circum-areolar incision (Fig. 1). This incision was modified in some cases to include the skin overlying the superficial tumors or the scar of previous biopsy. A thin pre-Camper's fascia flap was raised sharply in a spiral outward manner till removal of whole breast including the pectoralis major fascia as the deep border (Fig. 2). If axillary dissection was not feasible through the mastectomy incision, another axillary counter incision was made to perform the dissection (Fig. 3). All patients underwent immediate reconstruction after SSM with the use of either a Transverse Rectus Abdominis Myocutaneous (TRAM) flap or Latissimus Dorsi (LD) myocutaneous flap with a sub-muscular anatomical shaped, textured surface silicone gel implant. As it was preoperatively planned after discussion with the patient, the choice between the two types was mainly based on the nature of the abdominal donor site. If adequate tissue was available on the abdomen, a TRAM flap was preferred. Postoperative adjuvant therapy was planned including both chemotherapy and radiotherapy. Operative time, blood loss, hospital stay, timing of adjuvant therapy, postoperative complications, and follow-up (including local recurrence and distant metastasis) were recorded.

RESULTS

The mean age of patients at the time of surgery was 33.2±5.39 years (range, 24-42 years), while the mean tumor size was 5±0.73 cm (range 4-6cm). All patients were subjected to SSM with immediate reconstruction; contralateral pedicled TRAM flap was used in 12 cases (60%), while LD flap with sub-muscular implant was used in 8 cases (40%) Table 1.

Table 1. Tumor characteristics and reconstruction.

Tumor characteristics		No.	Percentage
Tumor stage	IIA	2	10%
	IIB	11	55%
	IIIA	7	35%
Reconstruction	TRAM*flap	12	60%
	LD**flap+ implant	8	40%

TRAM: Transverse Rectus Abdominis Myocutaneous flap.
LD: Latissimus Dorsi flap.

Surgery to the contralateral breast was not required because this technique can match the appearance of a ptotic breast so well (Fig. 5). Postoperative histopathological examination of the specimens revealed that 2 (10%) cases were stage IIA, 11 cases (55%) were Stage IIB and 7 cases (35%) were Stage IIIA Table 1. The operative time averaged 5.7 hours, including the mastectomy, while the average hospital stay was 6.2 days. None of the patients required blood transfusions as the mean blood loss was 400±77.8 cc. Some complications have been encountered during the immediate postoperative period. Three cases (15%) developed necrosis of a part of their native breast skin flaps, in the first, it was superficial and required only daily dressings to heal (Fig. 5), while the other two, it was full thickness necrosis near the

circumareaolar scar and was treated by debridement and 2ry sutures. One case with TRAM flap reconstruction developed partial flap necrosis that required debridement and 2ry sutures. Five cases (25%) developed seroma postoperatively that required needle aspiration on multiple occasions until resolution Table 2. All the patients received postoperative adjuvant chemotherapy with doxorubicin 50 mg/m^2, cyclophosphamide 500 mg/m^2 and 5-fluro-uracil 500mg/m^2 every 21 days for 6 cycles. The mean interval between surgery and the initiation of adjuvant therapy was 21.5±7.87 days (range, 14-40 days). As the inclusion criteria included a tumor ≥ 4cm, radiation treatment was delivered to all the cases and was initiated after completion of chemotherapy to all the cases. It was delivered to the reconstructed breast, the supraclavicular fossa, and, in some patients, the full axilla. The technical radiation delivery to the reconstructed breast and lymph nodes was similar to that for the intact breast and lymph nodes.[13] The reconstructed breast was treated using tangent fields to a dose of 50 grays (Gy) using 2-Gy fractions. A bolus of 1 cm thickness was applied to the reconstructed breast every other day.

Fig 1. Circum-areolar incision.

Fig 2. SSM with axillary dissection.

Fig 3. Immediate postoperative SSM, axillary dissection through separate axillary incision.

Fig 4. Immediate postoperative SSM with TRAM flap reconstruction of a ptotic breast.

Fig 5. Necrosis of the native skin.

Fig 6. Nipple & areola reconstruction.

Nipple and areola reconstruction was performed by local flap and tattooing after completion of the adjuvant therapy (Fig. 6). The mean length of follow-up from the time of SSM and reconstruction was 14.55±2.96 months (range, 12-22 months). None of the patients (reconstructed with LD flap and mammary prosthesis) experienced a significant amount of capsular contracture that required surgical intervention. However, in 4 cases (20%) we noticed that there was some shrinkage of the size of the reconstructed breast with time to become smaller than the normal size although excellent symmetry was present in the immediate postoperative period. Through-out the follow up period, none of the cases developed local recurrence. Only one case (5%) developed distant bony metastases detected 18 months postoperatively Table 2.

Table 2. Postoperative complications.

Complications		No.	Percentage
Immediate	Superficial necrosis of the native skin flap	1	5%
	Full thickness necrosis of the native skin flap	2	10%
	Partial flap necrosis (TRAM)	1	5%
	Seroma	5	25%
Late	Local recurrence	0	0%
	Distant metastases	1	5%

DISCUSSION

The objective of immediate breast reconstruction, regardless of the mastectomy procedure employed, is to improve the quality of life for the patient. To achieve this, patients should be provided with the best possible cosmetic result without jeopardizing oncologic safety.[7] Immediate breast reconstruction after SSM has been increasingly used for treatment of early breast carcinoma because of better cosmetic results.[9] The surgery has changed from a prolonged procedure, which involved shaping and modifying tissues with an absence of skin, to a quicker and more reliably performed filling operation, in which the skin envelope serves to maintain the anatomic boundaries of the breast, and the reconstructive tissue is used as "filler" material.[7]

The main oncological concern in SSM relates to the possibility of leaving residual tumor within the skin envelope which may manifest later as local recurrence.[4] Cancers with direct skin involvement and cancers too close to the skin to achieve adequate margins are considered a contraindication to SSM.[14] So, in this study modification of the wound has been performed to include the skin over the superficial tumors if the oncological safety would be compromised by performing the routine circum-areolar incision.

Native skin flap necrosis (partial or complete) has been reported to range from 3%[15] to 11%[16] of cases and is similar in SSM and non-SSM. Some authors[17,18] stated that the risk of skin necrosis could be reduced by avoiding the use of very thin skin flaps, accordingly, the flaps need only to be thin enough to accomplish the complete removal of mammary parenchyma. In this study necrosis of the native flap occurred in three patients (15%), and this relatively high incidence may be due to attempts at much thinning of the flaps to guard against residual breast tissue left. This complication together with other immediate complications listed in Table 2 were completely managed within a period ranged from 14-40 days (mean of 21.5±7.87 days), after which the chemotherapy was initiated with no delay. Clahsen et al,[19] found that the "immediate" commencement of chemotherapy within days of surgery appears to lack an overall survival advantage relative to chemotherapy given after a standard period of postoperative recovery. Buzdar et al[20] in their study included 460 patients with stage II or III breast cancer treated with postoperative chemotherapy and were not able to identify a survival benefit associated with any particular interval (e.g., 10 weeks, 10-13weeks, 14-17 weeks, and ≥18 weeks) between surgery and systemic therapy.

Given that all patients were with large tumor breast cancer (T ≥ 4 cm), all of them received postoperative radiation therapy, with no significant alteration of the aesthetic outcome of the reconstructed breast and none of the cases required surgery to either breast to assume symmetry. Despite the lack of randomized controlled trials and paucity of the published data, the current evidence suggests that the post-mastectomy radiation therapy does not represent a contraindication to skin-sparing mastectomy (SSM) and immediate breast reconstruction in the multidisciplinary setting,[4] and that it can be delivered effectively to the reconstructed breast without compromising the cosmetic result.[7,14,20-22] This can mainly be attributed to improvements in radiation techniques that may have rendered radiation less destructive to the reconstructed breast, therefore diminishing fibrosis.[7] However, some patients in our study experienced some shrinkage of the size of the reconstructed breast with time, so it is greatly advised to

slightly oversize the reconstructed breast so as to guard against this shrinkage.

Currently, it is accepted that no statistically significant difference exists in the rates of local recurrence, incidence of metastatic disease, or overall survival when comparing immediate reconstruction after SSM with reconstruction after conventional mastectomy (non-SSM) in patients with low-risk, early-stage breast carcinoma.[8,16,23-26] Local recurrence after SSM performed for early breast cancer was reported to range from 0%[25] to 7%[23,27]. Throughout an average follow up period of 14.55±2.96 months (range, 12-22 months), local recurrence has not been not encountered in any of our cases, however, only one case developed distant boney metastases at 18 months postoperatively. In a study by Foster et al[15] who performed SSM for locally advanced breast cancer, they reported a local recurrence rate of 4%, while it was 7.9% in another study by Downes et al[7] for patients with high risk disease. These results compare favorably with prior published series both for patients who underwent SSM (mostly T1 or T2 tumors; low risk) and for patients with locally advanced disease who were treated with or without reconstruction. This relatively low incidence of local recurrence may be attributed to the fact that local recurrence rates LR rates are associated not only with tumor size but also with inadequate surgical techniques, tumor aggressiveness, lack of expression of estrogen receptors, high histological grade, and lymphovascular invasion.[8,28]

However, we recognize that our follow up period is relatively short, therefore, it is difficult to draw final conclusions and we plan to observe these patients closely for a longer period.

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