

## Original Research Article

# Skin-sparing mastectomy with immediate latissimus dorsi flap reconstruction versus delayed reconstruction after modified radical mastectomy

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### ABSTRACT

**Background:** Oncoplastic breast surgery is a safe option in the treatment of early-stage breast cancer that preserves cosmesis without compromising recurrence or survival. Skin sparing mastectomy is oncologically safe based on the absence of breast ductal epithelium at the margin of the native skin flaps. Breast reconstruction with latissimus dorsi (LD) flap produces a high rate of good aesthetic results.

**Methods:** This clinical study included 20 patients who were managed in the general surgery department, Menofia university hospitals from April 2017 to March 2019. All patients had early breast cancer.

**Results:** Patients with SSM were younger than those with LD flap. In cases of SSM LD flap, average of operative time was 4.95 hours, range 4-6.5 hours, and a median of 4.75 hours with SD  $\pm 0.89$ . While in cases who did delayed LD flap Average time 2.8 hours and range 1.5-3.5 hours and SD  $\pm 0.65$ . The difference was significant. Average blood loss for the patients underwent SSM with LD flap was 975 cc while in those who underwent delayed LD flap reconstruction was 520 cc, and the difference was significant.

**Conclusions:** Skin-sparing mastectomy with immediate LD has become popular; it improves the cosmetic result, reduces cost, and anesthetic risk. It doesn't interfere with radiotherapy or chemotherapy.

**Keywords:** Skin sparing mastectomy, LD flap, Immediate breast reconstruction, Delayed reconstruction, Modified radical mastectomy

### INTRODUCTION

Breast cancer is the most common malignant tumor among women accounting for 25.1% of all cancers and is among the main causes of death in women.<sup>1</sup>

Advances in medical research have dramatically improved the treatment of this disease over the last 50 years.<sup>2</sup> In addition to chemotherapy and radiation therapy, partial and complete mastectomy of diseased and contralateral breasts has become more frequent.<sup>3</sup>

However, these surgical modalities often leave patients with anatomical deformities and altered body image, along with the psychological impact.<sup>4</sup>

Breast-conserving surgery with adjuvant radiotherapy is a safe alternative to mastectomy for the majority of women with early breast cancer.<sup>5</sup>

Skin-sparing mastectomy (SSM) followed by immediate reconstruction has been advocated as an effective treatment option for patients with early-stage breast

carcinoma.<sup>6</sup> It minimizes deformity and improves cosmesis through the preservation of the natural skin envelope of the breast.<sup>7</sup>

The latissimus dorsi (LD) myocutaneous flap remains an excellent choice for breast reconstruction with a low risk of complications and doesn't interfere with radiotherapy and chemotherapy.<sup>8</sup> This study was performed to compare SSM with immediate LD flap and delayed breast reconstruction with LD flap after modified radical mastectomy.

## METHODS

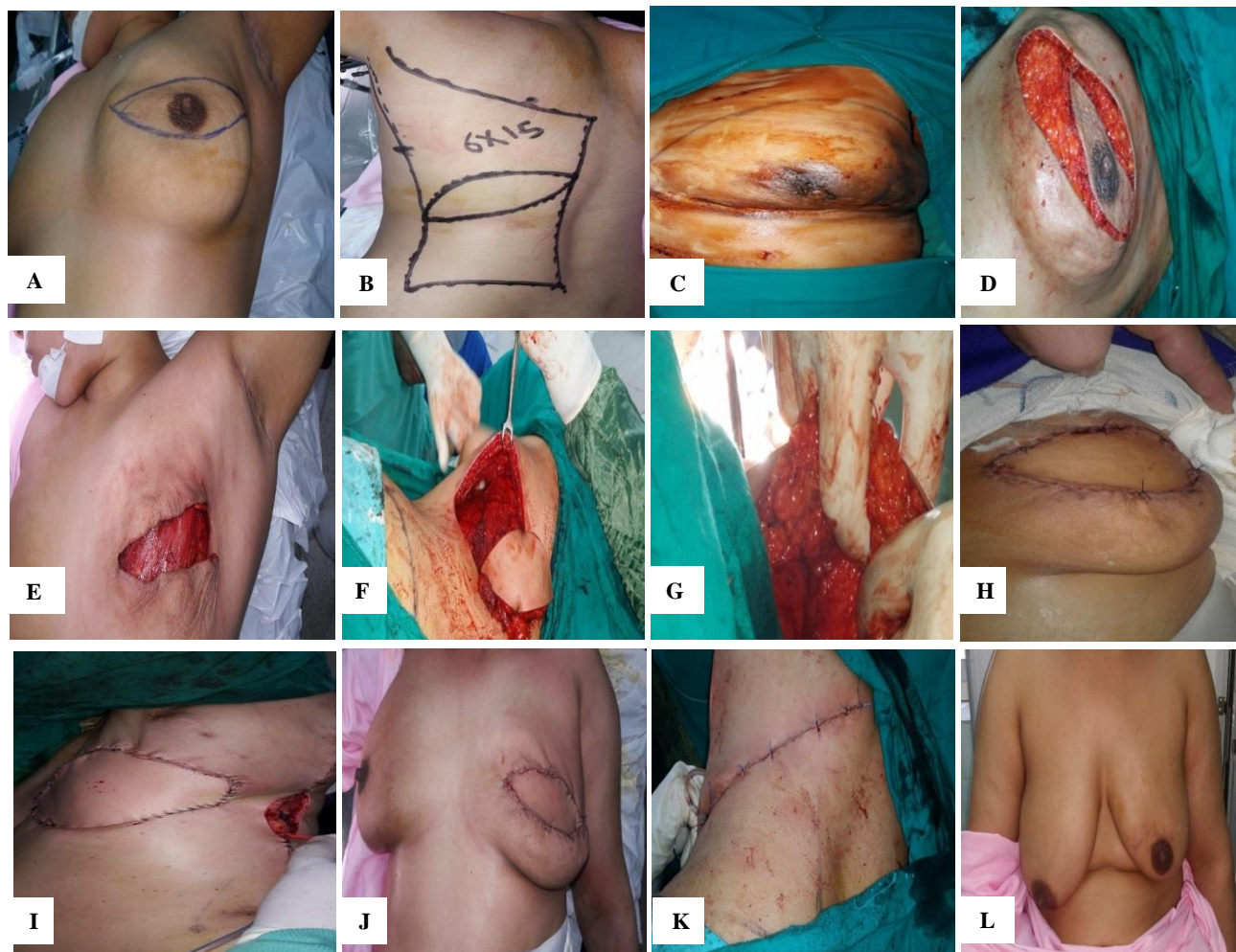
This prospective clinical study was conducted at the department of general surgery Menofia university hospitals from April 2017 to March 2019, it included 20 patients with early breast cancer divided into two groups: group one included 10 patients did SSM, group two included 10 patients did delay LD flap. All patients signed for informed consents for photography before and after surgical procedures.

## Inclusion criteria

Patients with early-stage breast cancer who are preferring mastectomy and immediate reconstruction; patient with T1, or T2 lesions, not candidates for breast-conserving therapy because of small breast tumor ratio, centrally located tumors, evidence of multi centricity and radiotherapy intolerance; isolated breast recurrence after breast conservation therapy; patients with DCIS necessitating mastectomy and patients who are scheduled for prophylactic mastectomy.

## Exclusion criteria

Exclusion criteria were locally advanced breast cancer (T3, T4 lesions); metastatic disease and inflammatory breast cancer; patients who have breast skin disease or systemic skin disease (scleroderma- telangiectasia); patient older than 60 yrs; or with medical disease contraindicating prolonged anesthesia; patients who don't prefer breast reconstruction.



**Figure 1: Intra-operative photos explain steps of skin-sparing mastectomy (arranged from left to right). (A) Marking of breast, (B) marking LD ms, (C) preparing for operation, (D) pre-areolar incision, (E) mastectomy, (F) dissect LD ms, (G) tunneling, (H-J) put flap and breast closure, (K) donor site closure, (L) post-operative.**

**In group one patient who did SSM**

Under general anesthesia in supine position preoperative marking of the inframammary crease (Figure 1A). Elliptical peri-areolar skin incision with medial and lateral extensions, including nipple-areola complex, biopsy site, and skin overlying superficial tumor if possible (Figure 1D). The skin flap is elevated superficial to enveloping fascia of the breast with 2 to 3 mm thickness in thin patient and 5 to 10 mm in a fat patient.<sup>9</sup>

All glandular tissue including pectoralis fascia is removed as in the standard procedure of modified radical mastectomy as we free the gland from the subcutaneous tissue medial to the parasternal line and then move to the second intercostal space with respect of inframammary crease caudally (Figure 1E). Laterally to the anterior axillary fold. In a superficial tumor, we did meticulous dissection and frozen section to ensure a free margin of skin overlying.<sup>9</sup>

A separate axillary incision is made transversely behind the border of pectoralis major muscle to expose the axilla, and axillary dissection is performed in continuity with breast tail removing all levels of axillary nodes (I, II and III).<sup>10</sup>

**In-group 2 who did delayed reconstruction**

Elliptical incision, including the previous scar, is done with upper and lower flap. 4-6 weeks pre-operative tissue expander may be helpful to provide adequate skin length. The incision extends to the axilla.<sup>10</sup>

**Autologous LD flap in both groups**

The patient is in the lateral position. The line of the cutaneous paddle is made in the posterolateral thoracic region (Figure 1B), in a crescent shape, opening upward. At the back, the rear tip of the cutaneous crescent comes almost to the anterior axillary line and passes a few centimeters from the anterior edge of the LD muscle (Figure 1F). The cutaneous paddle is detached in all sides while talking of the fat on the surface of the muscle; it is necessary to free the main pedicle completely and to dissect it almost to the circumflex scapular artery.<sup>11</sup> A subtotal section of LD tendon is made in such a way as to leave a small muscular bridge protecting the vascular pedicle from stretching. The completely raised flap is then passed to the anterior thoracic region. The flap is put in the subcutaneous layer in place of the breast over pectoralis major Ms (Figure 1J) using absorbable 2/0 suture. Then closure of skin is performed over 2 drains.<sup>12</sup> Then closure of donor site wound (Figure 1K).

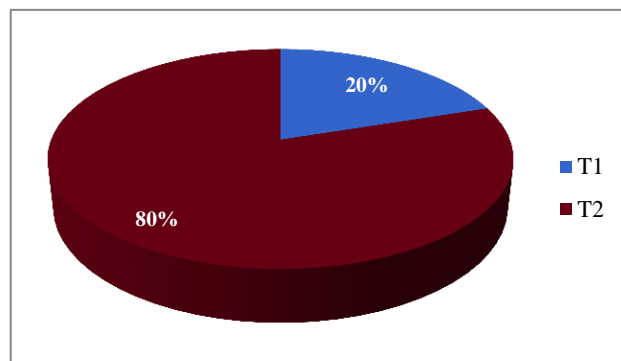
**Statistical analysis**

All data were collected, tabulated and statistically analyzed the descriptive measures of central tendency (mean and median) and measures for dispersion (range

and standard deviation), besides frequency and percentages were calculated by SPSS 20 (statistical package for the social science, SPSS Inc., Chicago, IL, USA).

**RESULTS**

Analysis of the data of 20 patients divided into two groups: group one include 10 patients who did SSM with immediate LD flap and group two include 10 patients who did delayed LD flap after a previous modified radical mastectomy.



**Figure 2: Significance of SSM.**

Patients in the study were selected to have early-stage breast cancer (stage I and II). (10 cases), two patients (20%) had undergone SSM for T1 tumors, and eight patients (80%) for T2 tumors (Figure 2). All patients were scheduled for complete axillary dissection, including all axillary levels (I, II, and III).

**Table 1: Age of the patients (n=10).**

| Age in years  | SSM   | Delayed LD flap |
|---------------|-------|-----------------|
| <b>Mean</b>   | 36.8  | 39.8            |
| <b>Median</b> | 37    | 39              |
| <b>Range</b>  | 21-47 | 29-55           |
| <b>SD</b>     | 7.72  | 8.02            |

The mean age for the group one was 36.8±7.7 years old and 39.8±8 years old (Table 1).

Patients in the study had either stage I or stage II tumors. Four cases (20%) had stage I disease while sixteen cases (80%) had stage II disease both stage IIA in five cases (25%) and stage IIB in eleven cases (55%). Invasive duct carcinoma was the dominant pathologic type in sixteen cases (80%) while invasive lobular carcinoma and was observed only in four cases (20%).

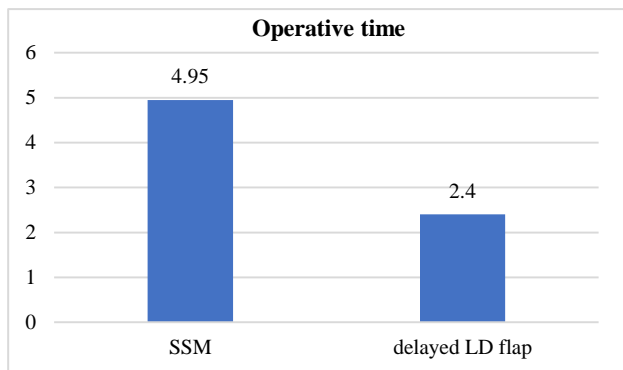
Grade II tumors were reported in sixteen cases (80%) and grades I reported in one case (5%). In addition, grade III reported in three cases (15%). Regarding the nodal status, twelve patients (60%) had positive axillary nodes, and eight patients (40%) had negative axillary nodes (Table 2).



**Table 2: Axillary lymph nodes.**

|                           | No. in SSM | %  | No. in delayed LD flap | %  |
|---------------------------|------------|----|------------------------|----|
| <b>Pathologically +ve</b> | 3          | 30 | 9                      | 90 |
| <b>Pathologically -ve</b> | 7          | 70 | 1                      | 10 |

30% +ve in SSM while 90% +ve in delayed LD.

**Figure 3: Operative time in hours.**

P=0.008 is highly significant.

The operative time was calculated from the induction of anesthesia until patient recovery. In cases of SSM LD flap reconstruction, in group one the average time was 4.95 hours with a range of 4-6.5 hours, and a median of 4.75 hours with SD  $\pm 0.89$  while in cases of group two who did delay LD flap, the average time was 2.4 hours with a range of 1.5-3.5 hours and a median of 2.5 hours. With SD  $\pm 0.65$ , the difference was statistically significant (Figure 3).

Complications following SSM classified into early (in the 1st month) and late (after 1 month) and were compared in patients who underwent LD flap. In the first group, there was 1 case (10%) of partial flap necrosis and no partial flap necrosis in-group two. Wound debridement was done one week postoperatively, and repeated dressings were done until the wound was completely clean. Then the wound was restored on cases of the total flap. Hematoma under the flap was observed in one case (10%) in group one and was evacuated. Seroma was the commonest complication following LD flap reconstruction and occurred in 2 cases (20%) in both groups and was treated by repeated aspirations. Minor wound infection was observed in one case both groups (20%) all not necessitated secondary sutures, all treated by local measures. Fat necrosis was observed in 2 cases (20%).

Late complications like hypertrophic scarring found one case (10%) in the first group and two cases (20%) in the second group.

The cosmetic results in this series were more than acceptable. 6 patients (30%) satisfied, and eleven patients are pleased (55%) while only three patients (15%) unsatisfied.

## DISCUSSION

The surgical management of breast cancer has been changed radically from the Halsted mastectomy to the modified mastectomy to lumpectomies and irradiation and now to SSM. SSM is the treatment of choice for many women with early-stage breast cancer and improves breast reconstruction results in several ways.<sup>13</sup>

In present work, we agree with that as SSM with immediate LD flap does not increase the risk of recurrence, is cosmetically acceptable, and there is no need for another operation for reconstruction.

Giles et al is an oncologically safe technique in a selected case as T1/T2; multicentric, ductal carcinoma in situ as prophylactic mastectomies. Further researches are required to confirm oncologically safety in T3 tumor.<sup>14</sup>

In present work, patients in the study were selected to have early-stage breast cancer (stage I and II). (10 cases), two patients (20%) had undergone SSM for T1 tumors, and eight patients (80%) for T2 tumors. All patients were scheduled for complete axillary dissection, including all axillary levels (I, II and III).

Immediate breast reconstruction is the standard procedure used to treat early-stage breast cancer. The main goal is to control cancer as effectively as mastectomy and achieving cosmetic results that are acceptable to patients. But making good cosmetic results is sometimes difficult. Good cosmetic results depend on some factors as excision volume, tumor location, and glandular density. Oncoplastic techniques can allow good cosmesis even after large excisions of breast volume.<sup>15</sup> The cosmetic result was dependent on the initial outcome of the reconstruction. If fat necrosis was present, however, irradiation tended to accentuate fibrosis and volume loss.<sup>16</sup>

In present work, adjuvant, therapy was delivered after a period ranged from 6 to 8 weeks. No delay in adjuvant therapy occurred after LD flap; adjuvant therapy was delayed due to partial flap necrosis and fat necrosis. 6 patients receive chemotherapy (CTH) in SSM and 4 in LD flap. 3 cases receive radiotherapy in SSM and nine cases in LD flap, (5 patients in SSM and 6 in LD flap receive Hormonal therapy. We reported only one case in-group one who did SSM had partial flap necrosis.

It is well established that radiotherapy contributes to inferior outcomes and complication rates in prosthetic breast reconstruction; the complication in autologous reconstruction is, volume loss and inferior aesthetic outcome for immediate reconstruction after radiotherapy compared with delayed reconstruction or immediate reconstruction without radiotherapy but these differences are insignificant.<sup>17</sup> The complication rate in the group who had primary reconstruction without radiotherapy was not significantly different from the group who had primary reconstruction with a radiotherapy complication

rate of PMRT following autologous breast reconstruction ranges from 5% to 16%. Volume loss, endarteritis with flap failure, fat or flap necrosis skin ulceration, and acute toxicity is the common complication.<sup>16</sup>

The latissimus dorsi myocutaneous flap is an excellent choice for breast reconstruction with a low risk of complications and doesn't interfere with radiotherapy and chemotherapy.<sup>18</sup>

In the present work, most of the patients have received postoperative radiotherapy. Three cases who did immediate reconstruction a good to excellent cosmeses with only one case of partial flap necrosis and one case had fat necrosis, in cases who had done delayed latissimus dorsi myocutaneous flap nine had previous radiotherapy one only had fat necrosis and treated by lipo-injection.<sup>19</sup>

## CONCLUSION

Immediate breast reconstruction does not impair the oncologic safety of breast cancer management, with no increase in local recurrence rates, and no delays in the initiation of adjuvant chemotherapy or radiation therapy.

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## REFERENCES

- Lucy D, Stephanie A, Abhishek C, Rula G, Nadia N, Brian J, Julia T, Carla S. Outcomes After Oncoplastic Breast-Conserving Surgery in Breast Cancer Patients. A Systematic Literature Review. *Annals Oncoplastic Surg.* 2016;23(10):3247-58.
- Damian M, Virgilio S. Skin sparing mastectomy. *Oncoplastic Reconstructive Breast Surg.* 2019;2(6):257-63.
- Pawel S, Kenneth S, Marek Z, Mark B, Cameron R. Autologous Breast Reconstruction with the De-nervated. Extended Latissimus Dorsi Musculocutaneous Flap. Springer Int Publishing Switzerland. 2016;6:717-25.
- Mahshid G, Zahra P, Hamid S. Incidence and Mortality and Epidemiology of Breast Cancer in the World. *Asian Pac J Cancer Prev. Cancer Control in Western Asia Special Issue.* 2016;2:3:43-6.
- Choi JY, Alderman AK, Newman LA. Aesthetic and reconstructive considerations in oncologic breast surgery. *J Am Coll Surg.* 2006;2(2):943-4.
- Fisher B, Anderson S, Bryant J. Twenty-year follow-up of a randomized trial comparing total mastectomy, lumpectomy and lumpectomy plus irradiation for the treatment of invasive breast cancer. *N Engl J Med.* 2002;4(6):1233-41.
- Mohamed S, Wail S, Antony J, Susan S, Joan T, Kefah M. Skin-sparing mastectomy and immediate breast reconstruction. Patient satisfaction and clinical outcome. *Int J Clin Oncol.* 2006;11(1):51-4.
- Galen P, Stephanie K, George C, Dustin E. Latissimus Dorsi Myocutaneous Flap for Breast Reconstruction: Bad Rap or Good Flap?. *Eplasty.* 2011;3(7):411-6.
- Meretoja T, Rasia S, von Smitten K, Asko-Seljavaara S, Kuokkane H, Jahkola T. Late results of skin-sparing mastectomy followed by immediate breast reconstruction. *Br J Surg.* 2007;94(10):1220-5.
- Munhoz AM, Aldrighi C, Montag E, Arruda EG, Aldrighi JM, Filassi JR, et al. Periareolar Skin-Sparing Mastectomy and Latissimus Dorsi Flap with Bio dimensional Expander Implant Reconstruction. Surgical Planning, Outcome, and Complications. *Plastic Reconstructive Surg.* 2007;119(6):1637-49.
- Hammond DC. Latissimus drsi flap breast reconstruction. *Plastic and reconstructive surgery.* 2009;124(4):1055-63.
- Mohammed A, Ayman A, Mahmoud B, Ayman N, Sherif M. The extended latissimus dorsi flap option in autologous breast reconstruction. A report of 14 cases and review of the literature. *Indian J Plastic Surg.* 2008;41(1):24-33.
- Roostaeian J, Sanchez I, Vardanian A, Herrera F. Comparison of immediate placement versus the staged tissue expander technique in breast reconstruction. *Plast Reconstr Surg.* 2012;129(6):909-18.
- Giles H, Kefah M: Skin sparing mastectomy. *The Am J Surg.* 2004;4(12):78-84.
- Xavier H, Kouwenberg CAE, Bijlard E, Burger KNJ, Jager A, Mureau MAM. The effect of immediate breast reconstruction on the timing of adjuvant chemotherapy. a systematic review. *Breast Cancer Res Treat.* 2015;153(2):241-51.
- Steele K, Macmillan R, Ball G, Akerlun M, McCulley S. Multicentre study of patient-reported and clinical outcomes following immediate and delayed Autologous Breast Reconstruction and Radiotherapy (ABRAR study). *J Plastic Reconstructive Aesthetic Surg.* 2018;71(2):185-93.
- El Kased AF, Akram SM, Hossam AE, Fol KE, Hagag MG. Evaluation of the round block technique in early breast cancer. *The Egyptian J Surg.* 2018;37:256-9.
- El Sisi AA, El Kashty SM, El Tatawy AG, Shoeib AMESES. Staged breast reconstruction after mastectomy using tissue expander followed by permanent prosthesis. *Menoufia Med J.* 2019;32:2528-33.
- Naguib S. Expanding the role of breast conservation surgery by immediate volume replacement with the latissimus dorsi flap. *J Egypt Natl Canc Inst.* 2006;18(3):216-26.

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