

# Experience with Extended LAD Flap for Autologous Breast Reconstruction

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## ABSTRACT

**Aim:** To evaluate the clinical outcome of extended Latissimus dorsi flap for autologous breast reconstruction at our Institution. Our study included 32 patients who were presented at Jinnah Burn Centre/ Jinnah Hospital, Lahore during last 3 years from Jan2014 to Jan 2017.

**Methods:** Over a three years period, thirty-two patients underwent breast reconstruction using the extended latissimus dorsi flap. Patients with small to moderate sized breasts were selected. In twenty-eight patients single stage reconstructing, after skin sparing mastectomy with or without axillary clearance, was carried out. Four patients presented for delayed reconstruction. Patient age ranged from 19-45Yrs with average age 32.8 Yrs.

**Results:** All of the flaps survived in thirty-two patients. We have not observed partial or total flap loss in our patients. One flap pedicle was cauterised during axillary clearance and that flap was salvaged by resection of involved part of the artery and microvascular anastomosis. The same patient developed fat necrosis too. Donor site complication included seroma formation in two patients which was managed conservatively by repeated aspiration and compression bandage. Hypertrophy of the donor site scar in one patient, hypertrophic scarring of the medial margin of recipient site scar in another patient. Contour deformity of the back was noted in all patients but was not an issue as was not visible by the patient.

**Conclusion:** Our preliminary experience reconfirms total autologous reconstruction with ELD flaps and is ideal for small and medium sized breasts.

**Keywords:** Extended latissimus Dorsi flap

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## INTRODUCTION

Breast Carcinoma is most common malignancy among women<sup>1</sup>. In Asia, one out of eight women is suffering from breast cancer and this incidence is increasing in general female population and in the younger age groups<sup>2</sup>.

Women with breast cancer are conscious of inevitable death, humiliation and loss of dignity<sup>3</sup>. Treatment of Breast carcinoma is multidisciplinary involving general surgeons, medical oncologist, radiation oncologist, histopathologist, rehabilitation physici and plastic surgeon. Treatment usually includes either breast conserving strategies or excisional procedures. Conservative surgery and breast reconstruction do not have any negative oncologic consequences<sup>4</sup>.

There are number of options available in surgeon's armamentarium for breast reconstruction, using either autologous tissue as pedicled/ free flap or using silicone implants. Autologous reconstruction can also be combined with implants in selected cases<sup>4,5</sup>.

Tansini was first to introduce latissimus Dorsi flap as myocutaneous flap in 1906. Since the flap has relatively constant vascular anatomy, along with adequate length and caliber of vessels, the use of this flap as free tissue transfer in reconstruction surgery for distant areas is well established.<sup>6</sup>The first "Extended " LD Flap was described by Holein and included lumbar fat extensions of LD flap<sup>11</sup>. Marshall et al gave the idea of T shaped flap design<sup>11</sup>. Papp et al published harvesting the maximally available skin paddle and using the de-epithelized dermal fat pad to

augment the tissue bulk.<sup>12</sup>Fluer-de-lis skin paddle was designed by McCraw and Papp to carry additional fat on the surface of LD muscle, creating the totally autologous LD breast reconstruction. <sup>13</sup> The design of an extended LD Flap has further evolved to include the parascapular and Scapular "fat Fascia" in addition to the lumbar fat for additional volume.

## PATIENTS AND METHODS

Our study included 32 patients who underwent breast reconstruction using and extended latissimus dorsi myocutaneous Flap. All patients were admitted at Jinnah Burn centre/ Jinnah hospital during the year 2014 to 2017. Twenty-eight patients underwent single stage breast reconstruction after tumour extirpation with or without axillary clearance and four patients presented for secondary reconstruction.

**Preoperative Planning:** The markings for flap were performed with the patient in standing position. The inframammary fold was marked on both breasts and tangent was drawn on to the chest wall also. Excision of the tumour with skin conserving and nipple sparing mastectomy (if possible) was marked. Lateral, medial and superior boundary of breast were marked. Special consideration was given to the lateral zones of adhesions on the chest wall. Markings were done for the subcutaneous tunnel, high up in the axilla, to deliver the flap into the breast pocket without disrupting the zones of adherence.

The dimensions of the missing skin segment on the mastectomy side were determined in relative to the contralateral breast. Skin pinch test at the lumbar area was

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done to assess the amount of fat that can be harvested. If skin pinch thickness was greater than 3 cm, the patient was suitable candidate for lumbar fat harvest.

**Flap Design:** The skin paddle of the flap was designed according to the deficient skin at the The size of skin Paddle ranged from 18 cm to 25 cm in length and 7 cm to 10 cm, depending on the patient's body habitus. Tip of the scapula, posterior midline and iliac crest were marked to define the peripheral limits of extended LD. All the flaps were raised at the level of superficial fascia of the back to include deep fat layer over the whole of ELD. Modification of ELD i.e. pre scapular fat and lumbar fat was included according to the need of bulk at the recipient site.

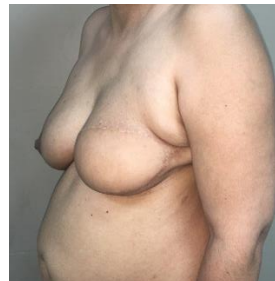
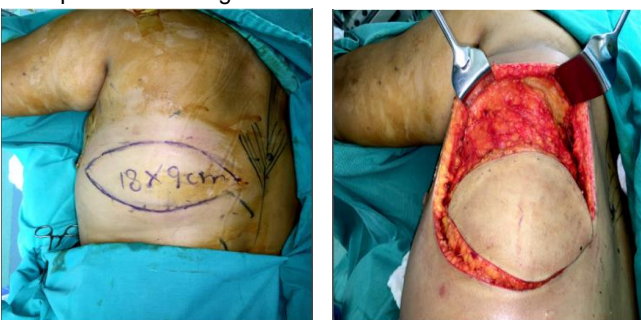
**Operative Technique:** All patients were first positioned supine with the arms in comfortable abducted position. Skin conserving mastectomy along with axillary clearance was carried out. Frozen sections were sent for tumour clearance from the wound bed and skin flaps. Wound was washed, packed with abdominal sponge and sealed with Tegaderm. The patient was then turned in the lateral decubitus position. The skin paddle was incised and the skin flap was raised at the level of superficial fascia of the back. After elevating skin flaps all over the LD muscle and including pre scapular and lumbar fat the dissection was proceeded to the deeper level. Anterior border of LD was separated from the serratus anterior by sharp dissection. The dissection was carried out superiorly to the teres major and inferiorly to the iliac crest. The LD muscle was separated from the lowermost fibres of trapezius muscle near the posterior midline and thoracolumbar fascia inferolaterally. Proximally, the serratus anterior and LD Muscle were separated to reach the level of the bifurcation of the thoracodorsal Partial release of tendinous insertion of LD muscle was done in all cases to increase the area of rotation and flap delivery.

Preop images



Flap harvest

Per-operative markings



## DISCUSSION

Breast cancer surgery has been revolutionized from conventional radical mastectomy of Halstedian era to the current concept of skin sparing mastectomy<sup>14</sup>.

Breast reconstruction after mastectomy is nowadays an integral part of rehabilitation, and immediate reconstruction has gained wide support<sup>15</sup>. Oncological safety of skin spring mastectomy has been well established now.

The autologous reconstruction is now widely accepted as the first choice for post mastectomy breast reconstruction. Several different skin paddle designs for the ELD Flap have been described. We have used the crescent shaped skin paddle in fourteen patients and achieved good aesthetic results. In eighteen patients, we have used simple 'ellipse shaped' transverse skin paddle marked out along the bra line. Placement of incision along the bra line helps to conceal the scar in a better way<sup>20</sup>.

Many surgeons have advocated division of humeral insertion of LD tendon and all the branches of thoracodorsal vessels to improve the excursion of the flap.<sup>19</sup> Clough et al also described partial or total sectioning of the LD tendon to increase the excursion of the flap. On the other hand Chang et al debated the necessity for the division of ELD humeral attachment.<sup>9</sup> The thoracodorsal nerve division also remains as issue of controversy. Proponents of leaving the nerve intact feels that nerve continuity may preserve maximum volume of the flap in the long term. They argue that because LD is fixed to the chest wall in a relaxed manner very little contraction is noted in the flap postoperatively<sup>22</sup>. On the other hand, other authors reported significant undesirable and involuntary breast movements related to this

preservation that may cause disturbance for many patients. They have recommended the division of nerve to prevent the undesirable muscle contractions<sup>19</sup>. Post operative muscle atrophy of twenty to twenty five percent due to division of the thoracodorsal nerve, was taken into consideration during the inseting of the flap<sup>19</sup>. In the present study, the thoracodorsal nerve was preserved in all cases to avoid secondary atrophy of the muscle and bulk of the flap. None of our patients have reported concerns regarding the undesirable contraction of the muscle. Donor site complications including seroma, hypertrophic scarring and contour deformity.<sup>22</sup> Excessive thinning can lead to insufficient blood supply, with the resultant skin and wound breakdown.<sup>24</sup> We have not experience skin flap necrosis in any of the patient. We suggest meticulous dissection in the anatomic plauses. There is a relatively high incidence of seroma formation after harvesting ELD flap. Chan et al reported significantly higher incidence in patients with a body mass index greater than or equal to 30kg/m<sup>2</sup> (38.6%) compared with an incidence of 8.7% in patients with a body mass index less than 30kg/m<sup>2</sup>.<sup>17</sup> The highest incidence of seroma formation was reported by Clough et al (72%). They stated satisfactory results after repeated aspiration but they did not try to prevent seromas by any of the proposed methods<sup>22</sup>. Application of multiple bolster sutures with a compressive dressing was described by Lee and Chang to avoid this problem.<sup>25</sup> The aesthetic results were evaluated as "good" for twenty-nine patients and "fair" for three patients. None of our patients had "poor" aesthetic outcome. The contour deformity of the donor site was significant but none of our patient complained about it .

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