

# Reconstruction of Tissue Defects With Pedicled Latissimus Dorsi Flap: Our Experience of 18 Cases

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At Sheikh Zayed Hospital we reconstructed 18 large tissue defects in various anatomical areas within a period of 2 years from March 93 to April 95. The tissue defects were created as a result of excision of tumor, excision of radio necrosed areas, traumatic exposure of bones or fracture sites. As the facility of microscope did not exist in Sheikh Zayed Hospital during this time, all Latissimus Dorsi flaps were used as pedicled flaps taking advantage of its wide area of rotation. In 18 consecutive flaps we did not have complete loss of flap only partial failure 25% of one flap. Flaps were mostly done as myocutaneous units for the reconstruction of head and neck region after tumor excision. Of the 18 flaps 13 (72.2%) were used to reconstruct head and neck area, 8 flaps (44.4%) for extra oral sites and 5 (27.75%) for intra oral reconstruction. 3 (16.6%) for chest wall reconstruction and 2 (11.1%) flaps were used to cover the exposed fracture sites around elbow. All flaps survived except one partial loss. Our experience is presented in this paper.

Latissimus Dorsi Flaps has been a work horse for the reconstructive surgeons for filling up large defects since it was described by Tobin and associates in 1981<sup>1</sup>. The flap has been used as pedicled muscle only as a pedicled myocutaneous or as a free microvascular tissue transfer<sup>3</sup>.

Although microvascular transfer of the flap gives better reconstructive maneuverability and less bulk of the pedicle but at the same time requires modern facilities for microsurgery.

In our settings where microsurgical facilities do not exist, the pedicled Latissimus Dorsi flap can be a very good option.

## Patients And Methods

Total number of patients who underwent reconstructive procedure with pedicled Latissimus Dorsi Flap is 18

from March 93 to April 95. Male: Female ratio is 2:1 (12 males and 6 females) and age ranged from 13-72 years.

Majority of flaps was used to reconstruct the head and neck area after tumor excision. Rest was used for chest wall reconstruction, in the area around elbow and upper arm. ( Table 1 )

**Table 1** n=18

Application to:	number	%age
Head and Neck area	13	72.2
Extraoral	8	44.4
Intraoral	5	27.75
Chest wall	3	16.65
Elbow and upper arm	2	11.1

The detail of patients is depicted in table 2

**Table 2**

Patient	Age	Cause of tissue defect	Flap type
AB	52F	Sq. Cell Ca. Rt Cheek	Myocutaneous
AN	49	Sq. Cell Ca. Rt pinna and cheek	Myocutaneous
RN	60	Extensive Basal Cell Ca. Lt cheek	Myocutaneous
WB	54	Extensive area of Radionecrosis Rt Cheek and orbit	Myocutaneous
NH	32F	Dermatofibrosarcoma Chin	Myocutaneous
AD	53	Sq. Cell Ca. Nape of neck	Myocutaneous
KB	56F	Sq. Cell Ca. Temporal area	Myocutaneous
NK	62	Extensive BCC pinna and temporal area	Myocutaneous
NB	72F	Sq. Cell Ca. Floor of mouth	Myocutaneous
AK	56	Sq. Cell Ca. Retromolar area	Myocutaneous
RA	47	Sq. Cell Ca. Tongue and floor of mouth	Myocutaneous
AA	69	Sq. Cell Ca. Floor of mouth	Myocutaneous
NA	51	Sq. Cell Ca. Tongue	Myocutaneous
AR	47	Dermatofibrosarcoma sternal and parasternal area	Muscle only with skin graft
HH	47	Liposarcoma Lat. and Ant. Chest wall	Muscle only with skin graft
AM	26	Recurrent extensive painful keloids with Radionecrosis in parasternal area	Myocutaneous
RH	13	Exposed supracondylar fracture Rt elbow	Muscle only with skin graft
MA	27	Ch. Osteomyelitis with multiple sinuses lower Humerus line	Muscle only with skin graft

## Repair of Tissue Defects

Out of 18 only 4 Flaps (22.2 %) were used as muscle only rest as myocutaneous units. This differentiation was made on account of type of tissue required for reconstruction. The maximum dimension of the skin paddle on the myocutaneous was 20x25 cms while smallest skin paddle was 6x4 cms.

After excising the pathology the tissue defect was assessed for type, bulk and dimensions. The shape of the defect traced on a piece of sterilized paper to prepare a template for the proposed flap. Patients positioned in 1/2 lateral or lateral position. The template projected onto the area of skin overlying the ipsilateral Latissimus Dorsi muscle.

The flap was dissected by a standard technique<sup>4</sup>. The dissection of the vascular pedicle was done as per the distance the flap needed to travel. For the head and neck reconstruction tunnel was created underneath the Pectoralis Major muscle, and clavicle and in the subcutaneous plane in neck and face area. For chest wall reconstruction tunnel was created in the subcutaneous plane or underneath the remaining Pectoralis Major muscle. For elbow coverage the tunnel was created in the subcutaneous plane on medial side of the upper arm. Flaps were transported through the tunnel avoiding any compression or kinks of the vascular pedicle. Once in the recipient site the flaps were fixed with 2 layer suturing (4/0 Vicryl for muscle fixation and intradermal suturing and with 3/0 Prolene for the skin closure) over vacuum drains. Large donor site was covered with split thickness skin grafts while smaller defects closed directly.

Postoperatively the flaps were monitored clinically i.e. color of the flap<sup>5</sup>, capillary blanching and needle pricks<sup>6</sup>. Routine observations of the patients were carried out. The vacuum drains from the tunnels and the recipient sites taken out in 24-48 hours depending on the drainage. Flap donor site is left in for longer period as it continues to drain some fluid. Patients follow up was scheduled as required for the original pathology.

### Results

Out of 18 flaps we had 1 (5.5%) partial loss of the flap. The necrosed skin was debrided fully and the underlying flap muscle was successfully skin grafted. This partial loss of skin was attributed, retrospectively, error in the flap design and hence tight closure. The intractably painful keloid was treated successfully as there is no recurrence at 2 years follow up. The exposed supracondylar fracture healed radiologically.

1 patient (5.5%) with extensive chest wall tumor who had large area of central anterior chest wall subtotal including most of the sternum died 48 hours postoperatively. This patient could not maintain his blood oxygen saturation despite the positive pressure ventilation.

We had 2 (11%) partial skin graft losses from the

grafted flap donor site

### Discussion

The Latissimus Dorsi has proved to be a workhorse for the reconstructive surgeon as it is a large piece of muscle and overlying skin. The muscle is a type V muscle according to the pattern of its blood supply<sup>4,7</sup>. A large muscle which has one dominant vascular pedicle (i.e. Thoracodorsal Artery and multiple small non dominant vessels entering into the muscle from the thoracic wall). The perforators coming out of the muscle supply the skin over the muscle. There has been various modifications and refinement of this flap<sup>8,9,10,11</sup>. It is a very versatile flap with large amount of tissue, which can be based on a good caliber artery.

The Latissimus Dorsi flap (either muscle only or as myocutaneous unit) in head and neck constructions indicated for the replacement of large amount of vascularized tissue when previous irradiation or surgery preclude the use of other more convenient flaps. The flaps were successfully used for Intraoral and pharyngeal reconstruction, Retromolar trigone, pharyngeal wall, floor of mouth, temporozygomatic region and cheeks. In these difficult areas a total flap loss was 6.7% and partial flap necrosis was 1.6%<sup>12</sup>. More common use of flap has been for the defects of the posterior neck, shoulder, anterior neck, face and occipital scalp<sup>13</sup>.

The use of microvascular free transfer of the flap has made a significant contribution to the reconstructive procedures in recent past. Although free microvascular tissue transfer gives better functional cosmetic results but the procedure is lengthy, laborious, requires special training and the equipment.

In Sheikh Zayed Hospital we did not have the facility of operating microscope until recently, so all the procedures were done as pedicle transfer. Vascularized flaps are usually a necessity for reconstruction after head and neck malignancies as the area is either irradiated pre operatively, when local flaps are not available because of the radiation damage or the post operative radiotherapy can be planned in early post operative period through the robust myocutaneous flap.

Transposing the flap through a sub pectoral and sub clavicular tunnel increased area of the rotation of Latissimus Dorsi Flap. Although cosmetic result of the reconstruction of face is slightly marked by the color difference in the donor and recipient skin, most of the patients were satisfied with the result.

In first 3 patients we experienced bulkiness in the region of anterior neck where the pedicle passed through the subcutaneous tunnel, later on this was minimized by the timing the tendinous part of the muscle to reduce the bulk. The outcome of reconstruction in the area around the elbow has been excellent.

In conclusion we find pedicled Latissimus Dorsi a reliable robust composite flap with a large area of rotation

which covers the upper half of the body.

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