

## MUSCLE FLAPS IN PLASTIC AND RECONSTRUCTIVE SURGERY GILLIES MEMORIAL ORATION—1979

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*Mr. President and Friends,*

At the outset I would like to express my gratitude and sincere thanks to the President, the Council and Members of the Association of Plastic Surgeons of India for having chosen me for the Gillies Memorial Oration this Year. I am fully conscious of the great honour you have bestowed on me and equally conscious of the greatness of all the previous orators and I do hope, I will be worthy of the honour you have bestowed on me.

Sir Harold Delf Gillies was born in Dunedin, New-Zealand on 17th June 1882 and died in London on 10th September 1960, at the age of 78. He was the father and as Mr. D.N. Mathews has stated was indeed a mastermind of modern plastic surgery. Most of our senior and first generation plastic Surgeons were trained by him or were associated with him. It was in his immediate presence that our Association was inaugurated in Nagpur in 1957. Since then our Association has grown from a few members to the present large strength of nearly 150 full members and 70 Associate members.

My only contact with the great man was during his visit to Madras in 1960, when he addressed the clinical Society of the Government

general Hospital and Madras Medical College. During the one hour address he kept the audience spell bound and roaring with laughter. I was an Assistant Professor in Surgery at that time and it was Sir Harold's visit that made me take up the speciality of Plastic Surgery.

I have chosen the subject of “Muscle Flaps in Plastic Surgery” for to-days oration, because the First milestone in the use of muscle flaps was planted by Sir Harold Gillies while treating one of the cases during the First world war where he had used the anterior portion of the temporalis muscle to augment a contour defect due to the loss of the Zygomatic bone and eye following a bullet injury. In recent time much work has been done and literature is full of reports on muscle flaps. We in our department have also been doing some work on these flaps and fifty two patients have been operated upon using muscle flaps for varying indications and had Sir Harold been alive today he would have been very happy with the development and use of muscle flaps.

### **Definition :**

Muscle flaps can be defined as a Flap of muscle transferred on a Vascular pedicle. The transferred muscle can carry the overlying

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skin when it is termed as a "myo-cutaneous" or it can carry the attached bone with the overlying skin when it is termed as "myo osseo cutaneous" flaps. This is not to be confused with free muscle grafts where the whole muscle is transfared as a free graft.

### Circulation in Muscle Flaps :

Brasch (1955) studied the blood supply to the individual skeletal muscles and proved that skeletal muscles can be used as muscle Flaps.

There are two types of blood supply on circulation in the muscles. These are the (1) Nutritive and (2) Non nutritive circulations. The Nutritive circulation takes place when the muscle is at rest and the Non nutritive circulation takes place when the muscle is actively contracting, and at this time it acts an venous pump.

The connective tissue framework encircling the skeletal muscle serves to carry, support and protect the blood vessels and lymphatics. The main source of blood snpply is from (a) The muscular branch from the neighbouring mai artery accompanies the nerve to the muscle. The site of entry of the artary and nerve is called the 'neuro vascular hilus'. This point of entry is relatively constant to most of the skeletal muscle (b) Subsidiary arterial supply enter the muscle from the periphery and close to the attached ends of the muscle. These are unnamed branches from neighbouring arteries. These arteries and arterioles ramify in the perimysial septa and give off capillaries which nourish the muscle fibres and their transverse anastomosis forms a three dimensional lattice.

From the arterioles of perimuscular anastomosis, perpendicular perforating branches are given off to the skin from under the deep fascia,

These perforating vessels anastomose with the dermal plexus of blood vessels. Even though the cutaneous blood vessels are the main source of blood supply to the skin, these perforators from the muscle blood vessels area vital and significant source of blood supply to the skin overlying the muscle.

In the myo cutaneous flap, the survival of the skin overlying the muscle depends much on these perforators. In the case of "skin Island-myocutaneous flap" the survival of the skin segment of the flap depends entirely on these perforators, hence in all types of muscle flap proceures preservation of the main neurovascular bundle at the hilus of the muscle and the perforators to the skin is vital.

### Indications :

In the course of the last two years we have done muscle flap procedures for varying indications in 52 patients. Table I give the etiological summary of the procedures done by us.

TABLE I

#### Etiological Summary of Muscle flap

1. <i>Carcinoma cheek post excisional defect reconstruction :</i>	
a. Sternomastoid myocutaneous as cover	6
b. Sternomastoid island flap for lining	5
c. Muscle pedicle	2
2. <i>Contracted Orbital cavity :</i>	
a. Temporalis muscle pedicle	3
3. <i>Exposed mastoid cavity :</i>	
a. Temporalis muscle pedicle	4
4. <i>Fracture both bones leg with nonunion :</i>	
a. Soleus, gastrocnemius, flexor hallucis longus	6



## Discussion

The use of Muscle flap in our speciality though recently developed remains yet to be fully exploited. It is clear that it gives a good tissue cover for reconstructive problems literally from head to foot. In general the indications are.

- (1) To cover poorly vascularised wounds ;
- (2) For functional purposes.
- (3) For cosmetic reasons.
- (4) For the revascularisation of tissue particularly bone, and
- (5) For filling of rigid cavities.

There are of course other indications as shown by our cases. The presence of infection as is not a contraindication but actually an indication, because the vascularity of the muscle tissue promotes healing and given antibodies and antibiotics access to the threatened tissue.

In the leg the skin cover is tight and as is well known local skin flaps in this region are notoriously risky. Fortunately muscle is an ideal recipient bed for free split skin graft. This means that muscle flap may be used in situations where there is no local skin available for reconstruction and the transposed muscle is simply covered with split skin graft. In the leg therefore the pedicle muscle flap has become an important alternative to the cross leg flap. Another great advantage is that this is a single stage procedure. It has also been found that in the treatment of fractures of bones either by conventional methods or by osteo-synthesis that covering the fracture site by a transposed muscle gives better results.

I have deliberately not gone into the technique as it will be time consuming but it is wise to remember these essential points :-

- (1) Choose only muscle which the patient will not miss.

- (2) Know the locations of neurovascular bundle and preserve it at all costs.
- (3) Know the amount of tissue wanted, where to find it and be sure it can reach its destination without tension.

Thus you find that there is a great scope for the muscle flap and it does give gratifying results and I request my Colleagues to use these flaps more often.

## Conclusion

Ladies and Gentlemen this Oration has been instituted by our Association in memory of, and to pay tribute to a truly great man and I am happy to have been chosen to pay my tributes to him. Our first generation Plastic Surgeons were trained and associated with him. I have only seen him and our next generation of Surgeons would have only heard of him. But whatever the circumstances may be the name of Sir, Harold Gillies will always be remembered as the father and master mind of modern Plastic Surgery for many more years to come and had he been alive to day he would have been happy and excited by all the developments that have come about since his time. So let us rededicate ourselves and strive to do our best to our patients and so our chosen speciality by emulating his ideals and dedication to work.

## Acknowledgement

Before I close, I would like to thank our Dean, colleagues in my department for helping me with this Oration, particularly Dr. U. S. Nayak, Associate Professor who had done most of the operative work and Dr. N. Mahendran, Asstt. Professor who has compiled the relevant material in presentable form.