

## Original Research Article

# Local facial flaps: a workhorse for reconstruction of facial malignancies defects

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### ABSTRACT

**Background:** Face represents complete personality of a human being, so adequate cosmetic correction of facial defects arising due to skin malignancy is very important. After excision, treatment option varies according to size and location of defect for small- or moderately-sized circular defects. In our study, we have evaluated versatility of local flap of face.

**Methods:** We have included 30 cases of skin malignancy on face in our Institute within the period of June 2016 to May 2018. 20 patients (66.6%) were male and 10 patients (33.3%) were female, in age group from 45 to 65 years. 17 cases had basal cell carcinoma, 10 cases had squamous cell carcinoma and 3 cases had malignant melanoma. Tumours were excised with safe margins and defects reconstructed with local facial flaps. We evaluated the early postoperative complications and after 6 months, cosmetic outcome and patient satisfaction was evaluated.

**Results:** 30 patients with small to medium-sized defect (3-6 cm), 8 cases were managed with V-Y advancement flap, 7 cases nasolabial flap, 8 cases forehead flap and, 4 cases Limberg flap, 4 cases cheek advancement flap. Postoperatively none of the cases had complications and the functional and aesthetic outcomes were quite acceptable. Aesthetic results were excellent in 15 patients (50%), while in 8 patients good results (27%) and 5 patient fair results (17%) after 6 month.

**Conclusions:** Local facial flaps are the simple and best option to reconstruct the small to medium size facial malignancies defects and provides excellent skin colour and texture match with gives good aesthetic result.

**Keywords:** Skin malignancy, Local facial flap

### INTRODUCTION

Human face is very important part of whole body, need to reconstruct after skin malignancy excised, so that it could accepted aesthetically and functionally. Non-melanoma skin cancer such as basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are most commonly occurs on face in Asian population due to greater exposure to solar ultraviolet radiation from depletion of the ozone layer. BCC constitutes more than three quarters of skin cancers of the face and the rest primarily consist

of SCC.<sup>1</sup> Risk factors for BCC include fair skin type, sun exposure, ionising radiation, advanced age, immunosuppression.<sup>2</sup> Facial malignancy are mostly curable when detected and treated early.<sup>3</sup> Various treatment modalities are available for reconstruction after excision of tumour of the face from full-thickness skin graft to local or distant flaps for resurfacing of defect. In this study, we have assessed the outcome of early skin tumour excision and reconstruction with regards to functional and aesthetic results of reconstruction with local facial flaps.

## METHODS

We have included 30 cases of skin malignancy on face in our Institute within the period of June 2016 to May 2018. Out of 30 patients, 20 patients were male and 10 patients were female, with the age from 45 to 65 years (mean of age- 55 year). 17 cases had BCC, 10 cases had SCC, 3 cases had malignant melanoma. All patients underwent wide local excision of the skin cancer with margins appropriate for the type, behavior, and size of the lesion. In these patients, facial malignancy (Basal Cell Carcinoma or Squamous Cell Carcinoma) were excised with safe margin confirmed by histopathology report; reconstruction of the small to moderate sized defect (3-6 cm) with various local facial flaps. Large defect >6cm formed after excision of malignancy were excluded. Patients with recurrent tumour and history of previous radiotherapy with nodal or distant metastasis were excluded. Tumours were excised with safe margins (3-6 mm) and defects reconstructed with local facial flaps. We evaluated the postoperative complications in the form of flap loss either partial or complete, wound dehiscence, hematoma, seroma and wound infection. The cosmetic outcome and patient satisfaction was evaluated at 6 months after surgery.

### Surgical procedure

#### Nasolabial flap

The flap was designed as an interpolation flap in which the final scar of donor-site closure lies exactly in the nasolabial sulcus. The flap was traced 1 mm larger in all dimensions to allow for post-operative contraction. The inset was thinned distally, leaving only 1–2 mm of subcutaneous tissue in the area of the inset. The donor site was closed by undermining adjacent cheek skin and advancing it, inferiorly and medially. Closure of the donor defect before closure of the primary defect brings the base of the flap closer to the nose, thereby facilitating subsequent closure of the primary defect with minimal wound closure tension. After further 3 weeks, the pedicle was divided. The residual pedicle, which served as a vascular carrier, was discarded, and the cheek was closed by advancement so that the final scar lies exactly in the alar-facial sulcus and nasolabial sulcus. The normal concavity of the nasofacial sulcus can be re-established, using an absorbable suspension suture placed between the undersurface of the dermis of the flap and the periosteum of the nasal bone or maxilla.



**Figure 1: Nasolabial flap for 63 years male with BCC on tip of nose.**

#### V-Y advancement flap

Sliding, subcutaneous V-Y flaps have been gaining in popularity. The advantages of having similar tissue in the same operative field, with an excellent blood supply, make the V-Y flap a common choice. The area of lesion excision and the flap was marked pre-operatively with margin of defect forming base of the triangle for V-Y advancement. Once all margins are known to be clear after tumour excision, the V-Y flap was dissected out and moved anteriorly on a subcutaneous pedicle to repair the defect. However, this flap has limitations as it can be used for relatively smaller defects. Some notching along the alar rim may occur.



**Figure 2: V-Y advancement flap for 52 years female with BCC on right cheek.**

#### Forehead flap

The forehead flap is a two-stage procedure, and patients should be explained this pre-operatively along with their appearance between the two stages of the procedure. The lesion and proposed margin of excision were marked. The proposed reconstruction flap was marked at the same time. For difficult areas such as those involving the medial canthus or the eyelids, mucosal or skin grafts were sutured to the under surface of the flap to reconstruct the conjunctiva. No cartilage grafts were used (to reconstruct the tarsal plate) because the flaps were “stiff” enough to provide self-support. Whenever possible (especially with defects extending to the nasolabial fold), primary closure of the edge of the defect was done. Lacrimal system reconstruction was not performed in any of the patients. Donor site was closed primarily or with split-thickness skin graft. Forehead flaps were divided 3 weeks later. The pedicles were returned to their donor sites in the forehead after excision of the skin grafts.



**Figure 3: Forehead flap for 45 years female with BCC on root of nose near medial canthus.**

### Limberg flap

Limberg flap is rhomboid flap with a parallelogram with two angles of 120° and two of 60°.

These angles can be modified depending on the shape of the lesion or defect. All sides of the rhomboid and all sides of the flap are equal. As many as four flaps can be raised from one rhomboid, if required. The elevated flap requires sufficient subcutaneous fat, and dissection must be carried past its base to prevent an elevated bump when it is transposed.



**Figure 4: Limberg flap for 60 years male with BCC on right cheek.**

### Cheek advancement flap

The cheek advancement flap has sufficient blood flow and large flap size and it is also flexible and easy to manipulate. It has been used for reconstruction of defects on cheek, lower eyelid, or medial and lateral canthus. After wide local excision the incision line ran transversely from the defect to the preauricular crease, earlobe, and occipital hairline inferiorly. When the incision line of the flap extended to the inferior earlobe and anterior occipital hairline, a larger flap could be elevated. The flap was elevated above the submuscular aponeurotic system (SMAS) and reconstructed the defect area by advancing while keeping subdermal plexus. The donor portion of the flap was closed with primary suture. Five to seven Penrose drain tubes were placed to prevent hematomas under the flap, and mild compressive dressing was done.



**Figure 5: Cheek advancement flap for 65 years male with SCC on left cheek.**

It has been our experience that most patients who undergo extensive nasal reconstruction were admitted an

overnight to aid in wound care and to ensure adequate intravenous hydration. Prescriptions at discharge include a broad-spectrum antibiotic, which is to be taken for 7–10 days. A mild pain reliever, such as diclofenac sodium, and an anti-emetic are often prescribed. Post-operative wound care consists of twice daily cleansing of the suture lines with spirit and application of an antibiotic ointment or petroleum jelly.

### RESULTS

After excision of malignant part with safe margin excised and become small to medium-sized defects (3-6 cm). Of these 30 patients, 20 were men (66.6%) and 10 were women (33.3%). After written and informed consent, patients were treated under either local or general anaesthesia. All patients tolerated the surgical procedures well with no systemic- or anaesthesia-related complications. 7 cases were managed with V-Y advancement flap, 8 cases with nasolabial flap, 7 cases with median forehead flap and 4 cases with Limberg flap, 4 cases with cheek advancement flap. Postoperatively, there were no infections or haematomas. All flaps survived completely, and there were no instances of flap loss.

**Table 1: Distribution of skin malignancy.**

Type of lesion/sex	BCC	SCC	Malignant melanoma
Male	12	6	2
Female	5	4	1
	17	10	3

**Table 2: Demographic data.**

Tumor diameter	From 30 mm to 60 mm, mean 45 mm
Age	From 45 to 65 years, mean 55 years
Tumor sites	Forehead: 5 cases; Cheek: 15 cases; nose: 10 cases

**Table 3: Surgical techniques used for small to medium sized defect on face.**

Type of procedure	No. of cases
V-Y advancement flap	7
Nasolabial flap	8
Forehead flap	7
Limberg flap	4
Cheek advancement flap	4

Follow-up ranged from 6 months to 2 years (18 months). Aesthetic results were excellent in 15 patients (50%), while 8 patients shows good results (27%) and 5 patient fair result (17%). The colour and texture matches were aesthetically good and the contour was distinct in all

patients. Therefore, local facial flaps were accepted in 94% facial malignancies defects with minimal morbidity.

## DISCUSSION

Face represents complete personality of a human being, therefore adequate cosmetic correction of facial defects arising due to skin malignancy is very important.<sup>1</sup> An increase in incidence is expected because of the aging population and greater exposure to solar ultraviolet radiation from depletion of the ozone layer.<sup>2</sup> Malignant lesions of face are basal cell carcinoma, squamous cell carcinoma, malignant melanoma. These lesions required excision of appropriate margins for malignant tumors depend on the cancer type, tumor size, tumor irregularity, and time elapsed from onset.<sup>3</sup> In cases of basal cell carcinoma, an appropriate excision margin would be 2 to 5 mm from the tumor, were as in cases with a small-sized lesion of <2 cm in diameter, it would be approximately 4 mm. On the other hand, in cases with a lesion of >2 cm in diameter or with a substantial delay after onset, the margin would be 1 cm, and in recurrent cases, it would be >1 cm.<sup>1,2</sup> Squamous cell carcinoma, excision margin would be 3mm-5mm, and for malignant melanoma, 5mm margin excised. We used safety margins of 3-6mm depends upon the type and size of the lesion. Various local facial flaps were used to reconstruct soft tissue defects after the surgical excision of skin tumors.

Primary closure is the most commonly used method to treat soft tissue defects. In the reconstruction of primary closure for circular defects, a dog-ear had been considered the standard approach. To avoid dog-ears, an elliptical excision would be needed that would include adjacent normal tissue. As a result, it would create a longer scar than the defect. Therefore, primary closure may not be appropriate for use in the facial region from a cosmetic perspective.<sup>4</sup> Skin grafting is usually performed when defects are large and unsuitable for primary closure. When Full thickness graft is used for lesion on face, graft take is less satisfactory, and distant flaps are bulky with a poor colour match. It takes several weeks for skin grafts to stabilise and match with the recipient site. Contracture may develop in the long-term follow-up.<sup>6</sup>

However, skin grafts are less desirable due to the colour differences between the donor and recipient sites and scarring.<sup>7</sup> Therefore, in our study, patients with small-to-medium defects, a local flap was preferred over skin graft and the application of which were dependent on skin tissue status and skin defect location. Advancement flaps are used when the patient is in overall good health and the defect is free of tumor and obvious infection. Flaps should match thickness, colour, and texture of excised skin. Resultant scars should fall in relaxed skin-tension lines. In follow up of our patients, we have found that good colour and texture obtained by local facial flaps and aesthetically results were excellent.

## CONCLUSION

Local facial flaps are the simple and best option to reconstruct the small to medium size facial malignancies defects and provides excellent skin colour and texture match with gives good aesthetic result.

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