



## FLAP RECONSTRUCTION OPTIONS AND OUTCOMES FOR CARCINOMA LIP - OUR EXPERIENCE

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### ABSTRACT

**Aim:** The aim of this study was to review and describe techniques for the reconstruction of defects after resection of lip squamous cell carcinoma with emphasis on cosmetic and functional outcome.

**Patients and Methods:** A review of techniques and selected case presentations using different flap designs for the reconstruction of perioral defects following resection of squamous cell carcinoma in 25 patients out of 128 cases of head and neck malignancies was performed in period of 2017-2018 in Regional Cancer Centre, Govt Coimbatore medical college hospital. The Abbe estlander, Nasolabial flap, Karapandzic flaps, deltopectoral, PMMF flap were used for lip defects.

**Results:** All reconstructed patients had acceptable functional results and healed without complication. Seven tumors were located in upper lip, Eight tumors in lower lip and Ten tumors in the angle of mouth. The lip defects were easily closed with the Karapandzic flaps, Abbe estlander, nasolabial, deltopectoral flap, forehead flap. While cosmesis was acceptable in all cases, the commissure was the most difficult region to reconstruct with an esthetic appearance and functional outcome. There were no flap failures. Oral competence was noted to be better in Karapandzic flaps, Abbe estlander flap, Nasolabial flap than deltopectoral/ forehead flap.

**Conclusion:** The Karapandzic, nasolabial and Abbe estlander flaps provide a easy and useful method to reconstruct perioral defects following resection for oral cancer.

**KEYWORDS :** Carcinoma lip, Flaps, Reconstruction, Cosmesis.

### INTRODUCTION

Carcinoma of the lip arises in the strip of exposed mucosa between the mucocutaneous junction and the point of contact of the lips. It constitutes 25% of oral cavity cancer and 4.5% of head and neck cancers as per GLOBOCON data<sup>1</sup>. Lip cancer has a low incidence in India. Although the incidence of lip cancer is low<sup>2,3</sup>, it is extremely important from surgical point of view with respect to aesthetic and functional outcome after surgery. More than 90% are squamous cell carcinomas (SCC) which is followed by basal cell carcinoma (BCC), adenocarcinomas of minor salivary glands and rarely melanomas. 90% occur in lower lip which is followed by commissure and upper lip (4%). BCCs generally occur in the upper lip and do not usually present lymph node metastases<sup>5,6</sup>. Carcinoma lip frequently appear on top of pre-cancerous lesions, such as radiodermatitis, chronic cheilitis and xeroderma pigmentosum. Fair skinned people with excessive exposure to sunlight are at risk. Other risk factors contributing to this disease include smoking, tobacco usage, chronic alcoholism. In immune compromised individuals oncogenic viruses also are responsible<sup>8</sup>. These lesions usually initially start as papule which then progress to proliferative or ulcerative form. The treatment by means of surgery or radiotherapy is planned based on appropriateness bearing in mind the site of the lesion, extent of post surgical defect, expected cosmesis in order to allow the best possible reconstruction, avoiding scarring that could lead to undesired morphological and functional damage. Various techniques have been developed for reconstruction lip and commissure. The choice of reconstruction after resection depends on the position, extent of the lesion, presence of nodal disease, surgical expertise. The goals of lip reconstruction are restoration of oral competence, maintenance of adequate oral stoma, preservation of sensation, maintenance of speech, skin cover and oral lining, adequate lower lip vertical height and prevent show of teeth and aesthetically satisfying result with good semblance of vermillion. The ultimate aim is to achieve a balance between adequate mouth opening and competent mouth closure, which is vital to the patient<sup>4</sup>. The mainstays for reconstruction of lip defects are local flaps, although free flaps may

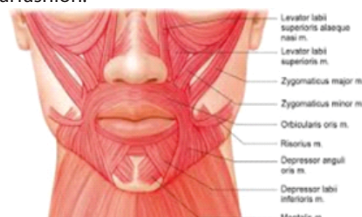
also be used for more extensive defects. Elective supra-omohyoid neck dissection (SOHND) is advisable to control occult neck metastases, in patients with high risk features like deep and perineural infiltration, commissure involvement and undifferentiated and relapsing tumours<sup>5</sup>. Radiotherapy is indicated for early stage (brachytherapy) or advanced tumours, for palliative reasons. It would come as no surprise that there is no single technique that can be ideal in all situations. In this study we evaluated our experience of using the Karapandzic flap, nasolabial flap, Abbe estlander, deltopectoral, tongue advancement flap to reconstruct lip defects.

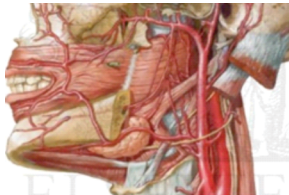
### PATIENTS AND METHODS

We systematically evaluated patients who underwent resection and flap reconstruction for lip carcinomas in our in Regional Cancer Centre, Govt Coimbatore Medical college hospital during period of 2017-2018. A total of about 25 patients underwent the procedure during this period. The demographic characteristics of the patients, location of the tumors, the dimensions of resection, flaps used for reconstruction, size of the oral stoma, aesthesia, functional aspects of the reconstruction in terms of oral competence were assessed.

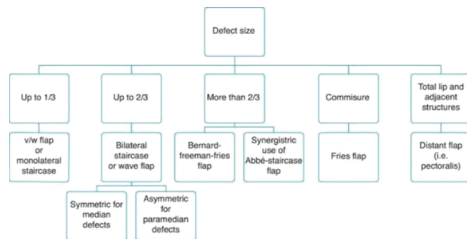
### LIP ANATOMY AND OPERATIVE TECHNIQUE

The oral sphincter is composed of the circumferential fibers of the orbicularis oris muscle and the radial orientation of the elevators and depressors from its outer margins. In addition, the sensory and motor nerves supplying the lips and the labial vessels also enter this area in a radial fashion.





This anatomy was exploited by **Karapandzic** which forms the basis of the flap. This flap is indicated for lower lip defect of (more than one third). **The cross-lip flap, or Abbe flap**, is a staged flap based on the labial artery. The Abbe flap is well suited for both upper and lower lip reconstructions. It is more commonly used as a lower lip flap transferred to the upper lip with both the central and lateral lower lip serving as a donor site. However, when the upper lip is used as donor tissue, the central philtral region is preserved given the delicate aesthetic balance of the central upper lip. The lateral upper lip serves as a donor site more commonly for transfer to the lower lip, most commonly used for commissural defect. One advantage of the cross-lip flap is the ability to replace a vertical segment of both vermilion and cutaneous lip tissue. The defect is assessed and the flap is designed to be half as wide as the defect to allow for balanced upper and lower lip lengths after flap transposition. The other types of flap used for reconstruction were forehead flap, deltopectoral flap in case of lesion involving buccal mucosa and lip. Tongue advancement flap was done for one patient who had lesion in the mucosal surface.



## RESULTS AND OBSERVATION

Out of 128 cases of head and neck malignancy, 25 were carcinoma lip. The site of lesion and flap used for reconstruction used were tabulated.

**TABLE 1. CA UPPER LIP**

S.NO	Age/gender	Involvement of lip	Reconstruction done
1	60/F	Right	Forehead flap
2	46/M	Right	Forehead flap
3	45/M	Right	Forehead flap
4	65/F	Left	Abbe estlander flap
5	65/f	Right	Nasolabial flap
6	58/f	Right	Nasolabial flap
7	65/f	Right	Nasolabial flap

**TABLE 2. CA LOWER LIP**

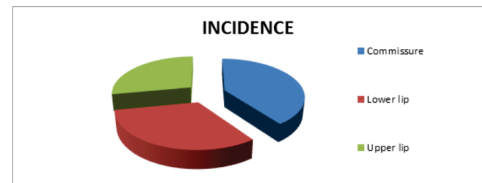
SL.NO	Age/gender	Reconstruction done
1	60/f	Deltopectoral flap with flap division
2	53/f	Abbe estlander flap
3	40/f	Abbe estlander flap
4	75/f	Karapandzic flap
5	55/m	Nasolabial flap
6	70/f	Deltopectoral flap
7	60/f	Nasolabial flap
8	55/f	Tongue advancement flap

**TABLE 3. CA ANGLE OF MOUTH**

SL.NO	AGE/GENDER	SIDE OF INVOLVEMENT	RECONSTRUCTION DONE
1	73/F	Left commissure	PMMC Flap
2	52/M	Left commissure	Deltopectoral flap
3	62/M	Both commissure	Abbe estlander flap
4	65/f	Right angle	Nasolabial flap

5	57/M	Left commissure	Abbe estlander flap
6	65/M	Left commissure	Abbe estlander flap
7	65/f	Left commissure	Karapandzic flap
8	54/f	Right angle	Forehead flap
9	40 /f	Left angle	Forehead flap
10	60/M	Left commissure	Abbe estlander flap

**Fig 1: Site incidence**



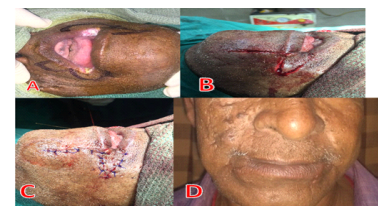
In our study 40% of cases were commissural lesions, 32% had lower lip lesion and 28% had upper lip lesion. In this regard we have a different incidence pattern with regard to incidence pattern. Though the literature gives lower lip as commonest site, in our study commissure lesions were more common than other sites.

**FIG 2: KARAPANDIZIAC FLAP RECONSTRUCTION – CARCINOMA LOWER LIP**



**A : Preop lesion B-C: Intraop images with flap reconstruction E: Follow up image.**

**FIG 3: BILATERAL COMMISSURE LESION WITH ABBE ESLANDER FLAP**



**A : Reoperative lesion in angle of mouth B-C: Intraop images D: Follow up image**

## DISCUSSION

Lips have a prominent place in our psyche, have many and varied connotations. In addition to their undoubted esthetic appeal, they have an important role to play in maintaining oral competence and speech, which are in turn dependent on a relatively normal morphology and an intact motor and sensory nerve supply. The local flaps used for lower lip defects (more than two-thirds) are mainly the Gillies fan flap, Karapandzic flap, McGregor and Nakajima flap, and the Webster-Bernard flap<sup>(6-10)</sup>. Nasolabial flaps and their modifications are other options for lower lip<sup>(9-11)</sup>. Local flaps that are used for upper lip defects are mainly the Gillies fan flap, Abbe flap, modified Karapandzic flap, McGregor flap, Nakajima flap, nasolabial flaps and the WebsterBernard flap.<sup>(7-9)</sup> The Gillies fan usually brings more tissue into the lip area but the issue with this flap is, commissure is distorted and also the lower lip is shortened<sup>(12)</sup>. The Karapandzic flap can achieve a functional lip with preserved sensation and competence, but major drawback of this flap is this may result in microstomia, which necessitates secondary commissuroplasty. The McGregor and Nakajima flaps pivot around the commissure, thus maintaining intercommissure distance, but new vermilion is required and muscle fibre direction is altered<sup>(13)</sup>. The Webster-Bernard procedure using cheek advancement flaps has cosmetically produce good lip reconstruction but due to perioral tissue loss, the lower lip shortens and causes contour

deformity<sup>(14,15)</sup>. The Fujimori nasolabial 'gate flaps' achieve lip reconstruction in a single stage with acceptable functional and cosmetic results, but retouch operations are often necessary<sup>(13)</sup>.

Distant free flaps (eg, the composite radial forearm-palmaris longus tendon free flap) are suitable for reconstruction of total lower lip and chin defects due to more soft tissue availability. But the cosmetic outcome of distant flaps are poorer than the local flaps in lip reconstruction. Other issue with distance flap is poor oral competence. In our study carcinoma upper lip accounts for 28% lower lip (32%) angle of mouth (40 %). Karapandzic flap was most suitable for lower lip defect, Abbe estlander for commissure defect, D P flap and PM flap for more advanced cases. There were no cases involved with neck dissection. There were no failure rate and functional competence was good.

## CONCLUSION

In planning a lip reconstruction, all aspects of flap design must be considered as they impact the ultimate aesthetic and functional outcome. A dynamic reconstruction with remaining lip tissue can provide superior results in terms of lip appearance and function in smaller lip defects. In our study 100% success rate and best results are observed with Karapandzic flap, Nasolabial flap, Abbe estlander flap.

## REFERENCES

1. Changing Trends in oral cancer - a global scenario ,Neha Gupta, 1 Ritu Gupta et al, Nepal J Epidemiol. 2016 Dec;6(4):613–619.
2. Baker SR. Current management of cancer of the lip. *Oncology*. 1990;4:107–120. [PubMed]
3. Vartanian JG, Carvalho AL, Araujo Filho, et al. Predictive factors and distribution of lymph node metastasis in lip cancer patients and their implications on the treatment of the neck. *Oral Oncology*. 2004;40:223–227. [PubMed]
4. A new technique for one-stage total lower lip reconstruction: Achieving the perfect balance Sandipan Gupta, MS MCh, Debarati Chattopadhyay Marang et al, *Can J Plast Surg*. 2013 Spring; 21(1):57–61
5. Zitsch RP, Lee BW, Smith RB. Cervical lymph node metastases and squamous cell carcinoma of the lip. *Head Neck*. 1999;21:447–453. [PubMed]
6. Moore SR, Johnson NW, Pierce AM, et al. The epidemiology of lip cancer: a review of global incidence and aetiology. *Oral Dis*. 1999;5:185–195. [PubMed]
7. Galyon SW, Frodel JL. Lip and perioral defects. *Otolaryngol Clin North Am*. 2001;34:647–666. [PubMed]
8. Karapandzic M. Reconstruction of lip defects by local arterial flaps. *Br J Plast Surg*. 1974;27:93–97. [PubMed]
9. Abbé RA. A new plastic operation for the relief of deformity due to double hairlip. *Med Rec*. 1889;53:447–447.
10. Adler N, Amir A, Hauben D. Modified Von Bruns' technique for total lower lip reconstruction. *Dermatol Surg*. 2004;30:433–7. [PubMed]
12. Fujimori R. "Gate flap" for the total reconstruction of the lower lip. *Br J Plast Surg*. 1981;33:340. [PubMed]
13. Jackson IT. Local flaps in head and neck reconstruction. St Louis: CV Mosby; 1985. p. 398.
14. Zide BM. Deformities of the lips and cheeks. In: McCarthy JG, editor. *Plastic Surgery*. Philadelphia: WB Saunders; 1990. p. 2021.
15. Shehab El-Din SA. Lower lip reconstruction with Fujimori gate flaps. *Egypt J Plast Reconstr Surg*. 2003;27:319–24.