



ISSN Print: 2394-7500  
ISSN Online: 2394-5869  
Impact Factor: 5.2  
IJAR 2019; 5(1): 318-321  
www.allresearchjournal.com  
Received: 19-11-2018  
Accepted: 21-12-2018

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## Oral defects reconstruction using nasolabial flap: Our experience

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### Abstract

**Introduction:** This article describes the use of nasolabial flaps in the reconstruction of various oral cavity defects which is a very useful and simple alternative to other pedicled and free flaps.

**Methods:** 16 patients were operated for oral cancers & reconstruction of defects was done using a nasolabial flap. A retrospective data analysis was done using data from patient medical records, including data on underlying pathology, defect size and location, surgical technique of flap harvesting.

**Results:** The patient group consisted of 16 patients out of which 10 were male and 6 were female, with a mean age of 51 years (range 30- 70 years). They were operated for oral cavity cancer at different sites and reconstruction was done using nasolabial flap. Complications includes erythema in 3 cases, hematoma in 2 cases, wound infection in 3 cases, Drooling of saliva in 4 cases, whistle deformity in 2 cases, partial flap necrosis in 1 case, total flap necrosis in 1 case, grade I trismus in 3 case & grade II trismus in 1 case.

**Conclusion:** The nasolabial flap has proved to be a useful and reliable alternative for smaller to medium size defects with minimal complications and good functional and aesthetic outcomes.

**Keywords:** Nasolabial flap, oral cancers, pedicled flap

### Introduction

Defects after resection of oral cavity malignancies may leave the patient with a significant functional and esthetic defect which depends on the anatomic site as well as size of the tumor. Small tumor lesions can be primarily closed, however defects after resection of large tumors require distant or local flaps. A variety of regional cutaneous, myocutaneous flaps & microvascular free tissue transfer flaps are available for reconstructive purpose.

The subcutaneous pedicled nasolabial flap was originally described by Sushruta in 600 BC. [1] Thiersch was first to create a transbuccal tunnel to transfer this flap intraorally for repair of an oral cavity defect. [2] Esser used cutaneous nasolabial flap & it in transferred in 2 stages to increase its reliability. [3] Wallace and Rose later modified this basic flap for single-stage transfer [4, 5].

The nasolabial flap is an arterialized local flap in the head and neck region with an axial blood supply provided either by the facial artery (inferiorly based) or by the superficial temporal artery through its transverse facial branch and the infraorbital artery (superiorly based). [6] The nasolabial flap may be superiorly or inferiorly based. An inferiorly based flap is useful in reconstruction of the lip, oral commissure, and anterior aspect of the floor of the mouth, while superiorly based flaps are utilized for reconstruction of the ala and tip of the nose, and the lower eyelids and cheeks. The choice of pedicle is based on the site of the defect and any need for rotation or advancement of tissue to the site of the defect [7].

This paper presents our clinical experience with nasolabial flaps for reconstruction of oral defects after resection of tumour.

### Material and Methods

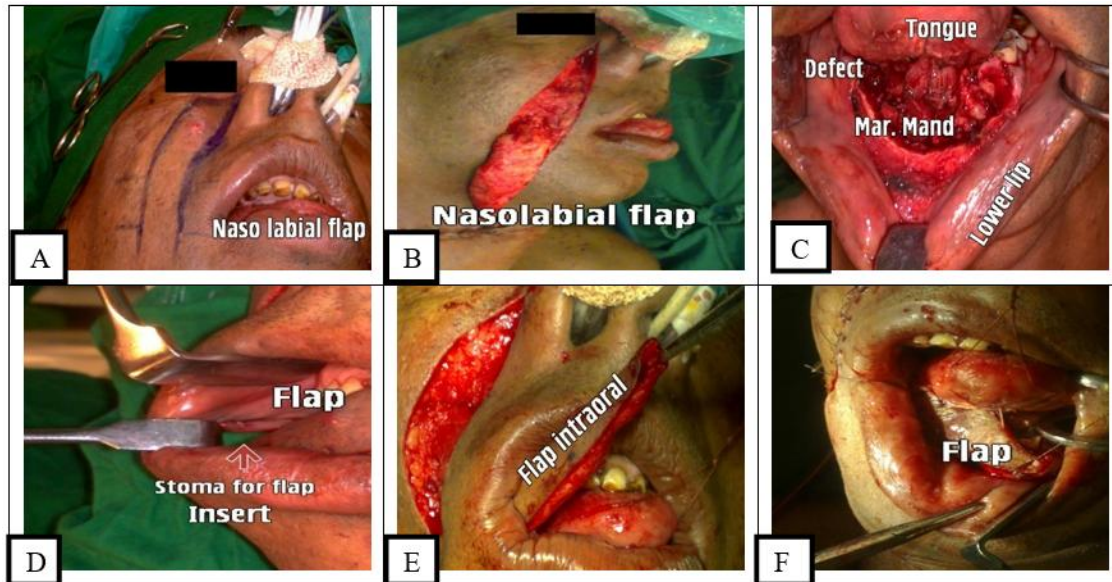
16 patients were operated for oral cavity malignancy & reconstruction of defects was done using a nasolabial flap. A retrospective data analysis was done using data from patient medical records, including data on underlying pathology, defect size and location, surgical technique of flap harvesting.

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**Technique of flap harvesting**

An inferiorly based flap is outlined on the cheek with the tip of the flap situated caudally to the medial canthus depending on the required length of the flap. The flap base is situated little below or just above the angle of the mouth. This design allows a flap length of 5-7 cm. With a width of the flap of up to 3 cm, the donor site can be closed primarily without tension. The flap is dissected in a supramuscular plane,

keeping the base of the flap as thick as possible. Entrance to the oral cavity is achieved by dissecting a transbuccal tunnel situated just opposite to the oral defect. Care must be taken not to injure the parotid duct while dissecting the tunnel. Also sufficient width of the tunnel is necessary to avoid constriction of the pedicle, flap is tunneled and delivered into oral cavity. Finally the skin island covering the intraoral defect is carefully sutured into its definitive position (fig.1).



**Fig 1:** Technique of flap harvesting. (A) Marking of flap on the cheek, (B) Raising of flap in supramuscular plane, (C) Defect created by excision of floor of mouth carcinoma, (D) Creation of transsugal tunnel for flap delivery, (E) Flap delivered through stoma, (F) Flap sutured over defect.

**Results**

There were 10 male and 6 female patients, with a mean age of 51 years (range 30- 70 years). All patients were diagnosed as a case of the squamous cell carcinoma, the nasolabial flap was used to cover defects of the buccal mucosa, lower lip, floor of mouth & alveolus after transoral tumor resection with supra-omohyoid neck dissection done on ipsilateral side in 5 cases and contralateral side in 1 case, modified radical neck dissection done on ipsilateral side in 10 cases. Facial artery sparing neck dissection was done in 5

of our case without any adverse effect on viability of flap. Nasolabial flaps were raised unilaterally in 15 patients, bilaterally in 1 patient, comprising a total of 17 flaps. All flaps were performed as a single-stage procedure with 100% inferiorly-based flaps.

Complications includes erythema in 3 cases, hematoma in 2 cases, wound infection in 3 cases, Drooling of saliva in 4 cases, whistle deformity in 2 cases, partial flap necrosis in 1 case, total flap necrosis in 1 case, grade I trismus in 3 case & grade II trismus in 1 case were seen. (Fig.4 A-E)

**Table 1:** showing data of 16 patients operated for oral cavity cancer with nasolabial flap reconstruction.

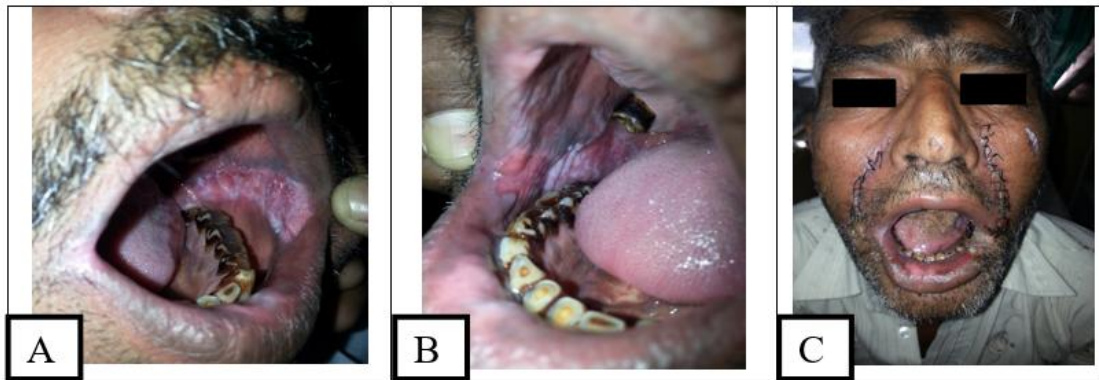
Age	Sex	Site of lesion	Tnm staging	Operative Prodecure	Ct/Rt	Complication	Trismus
43	M	GBS	T4aN0M0	WLE+ MM + SOHND	YES	ERTHEMA	NO
70	M	LIP	T3N0M0	WLE + MM + MND III	YES	ERYTHEMA	NO
40	M	GBS	T2N0M0	WLE+ PS + SOHND	NO	INFECTION	NO
68	F	ALVEOLUS	T4aN2bM0	WLE+ MM + MND III	YES	HAEMATOMA	GRADE I
52	M	BM	T1N0M0	WLE	NO	ERYTHEMA	LOSS TO FOLLOW UP
30	F	GBS	T4aN0M0	WLE+ MM + MND III	YES	HAEMATOMA	GRADE II
45	M	ALVEOLUS	T4aN2bM0	WLE +MM +MND III	YES	DROOLING OF SALIVA	LOSS TO FOLLOW UP
56	M	GBS	T4aN0M0	WLE+MM+ MND III	YES	DROOLING OF SALIVA	NO
62	F	BM	T2N0M0	WLE +SOHND	YES	DROOLING OF SALIVA	NO
42	M	BM	T3N0M0	WLE +SOHND	YES	WHISTLE DEFORMITY	NO
62	F	GBS	T3N0M0	WLE + MM + MND III	YES	WHISTLE DEFORMITY, INFECTION	NO
73	M	OC	T3N1bM0	WLE+MND III	YES	PARTIAL FLAP LOSS	GRADE I
41	M	BM	T2N0M0	WLE + SOHND	YES	INFECTION	NO
50	M	BM	T2N0M0	WLE + MND III ***	NO	NIL	NO
25	M	FOM	T3N2bM0	WLE + MM +SOHND (C) +MND III (I)	YES	DROOLING OF SALIVA	GRADE I
60	F	ALVEOLUS	T4aN0M0	WLE +SM+MND III	YES	TOTALFLAP NECROSIS	-

(BM – buccal mucosa,GBS – gingivobuccal sulcus, FOM – floor of mouth, OC – oral commisure, WLE – wide local excision, MM – marginal mandibulectomy, SM – segmental mandibulectomy, PS – periosteal stripping, MND –modified neck dissection, SOHND – supraomohyoid neck dissection, I –ipsilateral, C- contralateral).

\*\*\*B/l nasolabial flap was used in this case as there was suspicious lesion on opposite side on buccal mucosa which was also excised and reconstructed.



**Fig 2:** (A) Preoperative picture showing ulcer proliferative growth over right side of lip, (B) & (C) Post-operative picture showing reconstruction using nasolabial flap.



**Fig 3:** (A), (B) Showing pre-operative picture of patient having squamous cell carcinoma on Left buccal mucosa & leukoplakia on right buccal mucosa, (C) Showing post-operative picture with bilateral nasolabial reconstruction.



**Fig 4:** Complications of nasolabial flap. (A) Partial flap necrosis, (B) Whistle deformity, (C) Total flap necrosis, (D) Grade I trismus, (E) Grade II trismus, (F) Picture showing hair growth over nasolabial flap.

**Discussion**

The versatility and usefulness of the nasolabial flap is well known [8]. The flap has a good vascular supply; hence, survival is high [9]. An abundant blood supply allows for a length to breadth ratio of 3:1. The flap is good for small and intermediate (T1 to T3) intraoral defects. The blood supply of the nasolabial flap is attributed mainly to the facial artery. Facial artery was ligated in the neck dissection in the some of our cases without any adverse effect on the viability of

the flap, indicating that it may not be the facial artery but is more probably the rich sub dermal plexus that supplies the skin flap [10]. The fact that this flap withstands radiotherapy signifies its excellent vascularity.

Indications of nasolabial flap use includes small to moderate defects, medically compromised patients, free flap salvage surgery and reconstruction in the vessel-depleted neck.

Second-stage procedure is required in some of the cases, where a buccal tunnel is used for inseting the flap or a

second-stage commissural correction is required. Post-operative complications include hematoma, infection, flap necrosis, drooling of saliva, whistle deformity & trismus. Varghese *et al* published the largest case series of his work and experience of nasolabial flaps for intraoral reconstruction on 224 patients. They used an inferiorly based nasolabial flap in 198 patients, whereas 26 patients were subjected to use a superiorly based flap. They reported significantly higher complications in post-irradiated patients than in primary cases ( $p = 0.03$ ). The complication rate of nasolabial flaps is generally low and post-operative results are acceptable even when compared to other distant reconstruction options. They reported a flap loss rate of 5.5% (partial flap loss) and 6.3% (complete flap loss) respectively in their case series of 224 patients. In this study they achieved the flap success rate of 95.24% [6].

If flap is taken from hair-bearing skin for reconstruction, then hairs will grow over flap intraorally. This can be prevented by outlining the flap & postoperative radiotherapy also decrease the growth of hair and lead to mucosalization of the flaps (fig. 4F).

In modern era, Microvascular reconstruction has revolutionised the reconstructive part of surgical management of head and neck cancer, but it needs a dedicated and specialized team of plastic surgeons which are often not available even in best of centers. Therefore for surgeons involved in head and cancer treatment, loco regional pedicled flaps like nasolabial flap are the best options available for immediate reconstruction.

### Conclusion

The nasolabial flap has proved to be a useful and reliable alternative for smaller to medium size defects with minimal complications and good functional and aesthetic outcomes.

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