

## Nasolabial Flap for Tongue Reconstruction

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### ABSTRACT

**Background:** Nasolabial flap has proven a reliable flap in the reconstruction of oral cavity and the facial defects over a period of time. However there is not much of literature of using this flap for reconstruction of isolated defects of tongue. We carried out this study in our population to assess the role of nasolabial flap in reconstruction of isolated tongue defects.

**Methods:** Descriptive study of 25 patients with T1 and T2 tongue cancer selected through non probability sampling admitted in the department of ORL, Head & Neck Surgery, King Faisal Specialist Hospital & Research Center, Riyadh and AIMC/Jinnah Hospital, Lahore, from March 2007 to September 2010. The functional improvement in form of speech and swallowing was evaluated, post operatively.

**Results:** The flap was successfully taken in 24 patients with one flap failure. This is locally available flap with minimal operating time and doesn't require microvascular skills. The results of speech and swallowing after reconstruction were excellent.

**Conclusion:** Nasolabial flap is an excellent locally available flap for the reconstruction of the anterior two third of the tongue with very minor, if any postoperative cosmetic defect.

**Key words:** Nasolabial flap, Carcinoma tongue, Tongue reconstruction.

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### INTRODUCTION

Oral cavity cancers represent 30% of the cephalic extremity tumors. Their resection requires in the majority of the cases a reconstruction by soft tissue. The reconstruction must be simple by bringing some reliable, hairless, thin, resistant tissue to radiation therapy, with a limited morbidity and an acceptable scar ransom. Nasolabial flap is the robust flap which fulfills most of these criteria and can survive even when its main arterial supply was cut during surgical procedures<sup>1</sup>. This flap was used from 600 BC, in India by Susruta, to reconstruct many facial defects mainly of nose and also used extensively in the reconstruction of floor of mouth defects with minimal facial cosmetic defect<sup>2</sup>. But surprisingly, there was very little literature documenting the use of his flap in the reconstruction of tongue primarily after resection for malignant lesions for T<sub>1</sub> and T<sub>2</sub> tumours. We have used this flap in the reconstruction of facial defects and floor of mouth. But here we are presenting our experience with this flap in reconstruction of tongue defects.

### PATIENTS AND METHODS

Twenty six patients, 11 male and 15 females with T<sub>2</sub> squamous cell carcinoma of tongue, involving the

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in this study. These were the patients that attended the Head and Neck Clinic at King Faisal Specialist Hospital in Riyadh, Saudi Arabia between May 2002 and January 2005. All these patients were from south of the Kingdom, due to the peculiar habit of chewing "shamma" (a kind of leaf that is available locally in southern part of Saudi Arabia which is highly carcinogenic), equally prevalent in both sexes. The age range was between 45 to 80 years. Most of the tumours were indurated and required hemiglossectomy for free resection margins. Patients with tumour involving only tongue without any involvement of floor of mouth were included in the study. It is our policy to do routine supraomohyoid neck dissection in all tongue tumours, clearing level I, II and III, even if it is N<sub>0</sub> neck on the involved side, due to high incidence of occult metastatic nodes in the neck. Out of these 26 patients, 6 patients had radiation as the primary modality of treatment, as 4 of them refused surgery initially and 2 of them, due to medical reasons, opted for radiation initially. These 6 patients had to undergo salvage surgery for recurrence. All these patients were worked up preoperatively with CT scan and when necessary MRI scans. 5FDG PET scan was used in all these cases for evaluation of distant metastasis. 6 of the patients had PET uptake at level 2 ven though clinically they had N<sub>0</sub> neck. All nasolabial flaps were done as inferiorly based, designed in the nasolabial fold on cheek of the same side as the tumour was. These flaps were done as two staged procedure. The

second stage, for the release of flap was done as an outpatient procedure after 2 weeks of the primary procedure. In 8 of these patients, the facial artery was carefully dissected and preserved while doing the supraomohyoid neck dissection on the same side.

The flap was inferiorly based at angle of mouth and elevated as a pedicled cutaneous flap, above the muscular plain to avoid injury to facial nerve. The flap was tunneled into the oral cavity through cheek at the angle of mouth, with blunt dissection through orbicularis oris muscle. The flap was then sutured to the defect of the tongue. The resulting tunnel in the cheek was closed around the flap pedicle without tension. The defect on the donor area was closed by wide undermining of the skin and primary approximation and sutured in double layer. Nineteen of these patients were edentulous and 7 patients had full set of teeth. All these patients were fed orally on the 2<sup>nd</sup> post operative day without any problems. Post operatively, we measured their legibility of speech and any swallowing problems.

## RESULTS

Twenty five out of 26 flaps were successfully taken. The one flap failure was in a diabetic, 72 year old patient, who had prior radiation and developed infection at the flap side. In general prior radiation did not make a difference in the take up of the flap. Post operatively there was no cosmetic defect noted, both family and the patients were happy with the cosmetic result.

Even though all of them were fed on the second post operative day, none of them had any leak through cheek fistula. Presence of teeth caused a little discomfort for the patients in closing the mouth completely and chewing solid food. They were advised to use soft diet till the flap was divided. The flaps were completely taken even in dentulous patients; none of them chewed the flap to the extent of flap loss. Some growth of the hair on the tongue, mainly in the male patients, was noted but surprisingly none of them complained about this. Even these hairs decreased over the time and in some patients completely disappeared within 3 months. Due to the robust blood supply in the face, even when the angular artery was cut to raise the flap and facial artery was tied while doing the neck dissection; the flap was not compromised due to the supply from buccal artery and from contralateral facial artery through its labial branches. Keeping the facial artery on the same side during the neck dissection did not make any significant contribution to the survival of the flap especially when the neck dissection was unilateral. One patient had slight

weakness at angle of mouth, which improved over the time to normal. None of the patients had any swallowing difficulty, inform of dysphagia, odynophagia or aspiration of food. Speech assessment was graded as

Grade I: Completely normal speech

Grade II: Legible speech to the outsiders

Grade III: Legible to the family only

Grade IV: Illegible speech.

25 patients had grade II speech and the one patient who had flap failure, had grade III speech.

## DISCUSSION

Resection of floor of mouth and tongue has long lasting detrimental effects on mastication and speech functions. For the reconstruction of tongue, pectoralis major myocutaneous pedicle flap and free forearm radial flap have been used<sup>3</sup>. The inherent problems with pectoralis myocutaneous flaps are that they are bulky, especially in women and they limit the mobility of the tongue when used for the reconstruction of anterior 2/3<sup>rd</sup> of tongue. Radial free forearm flap is definitely better than pectoralis major myocutaneous flap but has prolonged surgical and anesthesia time, needs special skills, and leaves an ugly scar on the forearm. General medical condition of the patient also may not allow a prolonged surgical procedure. Nasolabial flap is a very good alternative It is locally available flap for the reconstruction of tongue in anterior 2/3<sup>rd</sup> with much reduced operating time and with minimal cosmetic defect at the donor site. It combines the pliability of the skin with the bulk required for the reconstruction of tongue.

A mobile and reasonable bulk of tongue after partial resection is essential for good speech and swallowing. It is our policy to leave the tongue to heal with secondary intention if the resected part is 1/3 or less. But when half or more than that of the tongue is removed, it is prudent to add bulk to the tongue. This is done either by local nasolabial flap or by using free forearm flap, depending upon the extent of resection. Nasolabial flap was used when the resection area was not more than 6x4 cm. When resection was larger than this or when the floor of the mouth was resected along with partial or hemiglossectomy, radial free forearm flap was used. Nasolabial flap is dependable and locally available flap for the reconstruction of facial and oral cavity defects of limited size. The average time to harvest and repair, is not more than 20 minutes. Face has abundant blood supply and this enables surgeons to alter the usual 3:1 length to breadth ratio for random pattern flaps. It can be increased to 5:1 for the inferiorly based Nasolabial flap<sup>4</sup>. Here we used this flap successfully for the reconstruction of tongue. We felt

that it is mandatory to do this procedure in two stages for tongue. Because in the first stage after the flap is placed, it hampered the mobility of the tongue and second stage was necessary to release it. There was one flap failure, in a diabetic patient, who developed infection and also had pre operative radiation. Local complications in form of poor wound healing has been reported, with a variable incidence of 12% to 20%<sup>5</sup>. In our study there was no problem with the wound healing even in the patients undergoing salvage surgery. In another study of 16 patients, the complications were reported as wound dehiscence in 2 flaps, loss of flap in 1 and bulky flap in 1<sup>6</sup>. There was one partial loss of flap out of 29 patients in a study by (Rokenes et al) due to chewing of the flap<sup>7</sup>, but none of our patient had such problem. None of the patients had complained about hair growth intraorally on the flap, although it was seen in few male patients. However, this problem disappeared in all of them within 3 months of surgery. Musculo mucosal facial artery pedicle flap has been described as an alternative to the traditional nasolabial flap to avoid hair growth and external scarring<sup>8</sup>. Different modifications of the flap like nasolabial flap along with island of submental flap, which was successfully used to reconstruct upper and lower lips and oral commissure<sup>9</sup>, and advanced cases of submucous fibrosis to relive trismus, (a condition peculiar to Indian subcontinent due to the habit of chewing of "betel nut") have been described in literature<sup>10</sup>. But none of the modifications of the standard flap were used in our patients, since there were no problems regarding healing and flap failure. The results regarding speech and swallowing were excellent and were comparable to the patients who underwent reconstruction with free forearm radial flap.

## CONCLUSION

Nasolabial flap is simple, effective and safe flap with low complication rate. It is a very good alternative to free flaps for the reconstruction of tongue in its anterior 2/3<sup>rd</sup>, when the patients have anesthesia risk for prolonged surgical procedure and in institutions where free flap expertise is not available. It needs minimum technical skills and can be done by an average Otolaryngologist. It is locally available with minimum cosmetic deformity to the donor site. For tongue alone it needs to be done in two stages.

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## REFERENCES

1. Lazaridis N, Tilaveridis I, Karakasis D. Superiorly or inferiorly based "islanded" nasolabial flap for buccal mucosa defects reconstruction. *J Oral Maxillofac Surg.* 2008 Jan; 66(1):7-15.
2. Joshi A, Rajendraprasad JS, Shetty K.: "Reconstruction of intraoral defects using facial artery musculomucosal flap". *Br J Plasti Surg.* 2005 Dec; 58(8): 1061-6
3. Varghese BT, Sebastian P, Cherian T, Mohan PM, Ahmed I, Koshy CM etal. Nasolabial flaps in oral reconstruction: an analysis of 224 cases. *Br J Plast Surg.* 2001 Sep ;54(6):499-503
4. Fossion E: "The inferiorly and superiorly based Nasolabial flap for the reconstruction of moderate sized oronasal defects". *J Oral Maxillofac. Surg* 1998; 56: 1260-263.
5. Peter Maurer, Alexander W. Eckert, Johannes Schubert: "Functional rehabilitation following resection of floor of the mouth: the Nasolabial flap revisited". *Journal of Cranio- Maxillofacial Surgery* (2002);30: 369-372
6. C.loannides. E. Fossion: "Nasolabial flaps for the reconstruction of defects of the floor of the mouth". *Int. J. Oral Maxillofac. Surg.* 1991; 20: 40-43
7. Rokenes HK, Bretteville G, Lovdal O, Boysen. The nasolabial skinflap in intraoral reconstruction. *ORL J Otorhinolaryngol Relat Spec.* 1991;53(6):346-8.
8. Pribaz J , Stephens W, Crespo L, Gifford G : "A new intraoral flap: Facial artery musculomucosal(FAMM) flap". *Plastic Reconstr. Surg* 1992; 90: 421- 429.
9. Daya, Mahendra, Mahomva, Oliver, Madaree and Anil: "Multistaged reconstruction of the oral commissures and upper and lower lip with an island submental flap and a Nasolabial flap". *Plastic and Reconstructive Surgery: Volume 108(4) 15 September 2001 pp 968-971.*
10. Cunha-Gomes D, Kavarana NM, Choudhari C, Rajendraprasad JS, Bhatthana HM, Desai PB etal. Total oral reconstruction for cancers associated with advanced oral submucous fibrosis. *Ann Plast Surg.* 2003 Sep;51(3):283-9