

USE OF COMBINATION OF NASOLABIAL FLAP AND ABDOMINAL FAT FOR RECONSTRUCTION OF THE DEFECT OF THE ORAL CAVITY AFTER SURGICAL RESECTION OF CANCER:A CASE REPORT



Oncology

Dr. Mansi Dey*	MDS Student, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India. *Corresponding Author
Dr. Amit Sarkar	MDS, Student, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.
Dr. Menka Gupta	MDS, Student, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.
Dr. Udit Rohatgi	MDS, Student, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.
Dr. Balram Garg	MDS, Reader, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.
Dr. Vidhi C. Rathi	MDS, Reader, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.
Dr. Sanjeev Kumar	MDS, FDSRCPS, Head of Department, Oral and Maxillofacial Surgery, ITS Centre for Dental Studies and Research, Muradnagar, Ghaziabad, Uttar Pradesh, India.

ABSTRACT

Introduction: Squamous cell carcinoma of the buccal mucosa is aggressive in nature, spreads rapidly and has a very high recurrence rate. This makes proper management of these tumors mandatory. A variety of methods are available for reconstruction of the defects in the oral cavity.

Presentation of Case: The present case describes the surgical management of the carcinoma of the right buccal mucosa and its reconstruction following resection.

Discussion: The defect after surgical resection of the cancer was done using nasolabial flap while the residual defect left uncovered was reconstructed using abdominal fat.

Conclusion: Though the nasolabial flap is a good alternative for reconstruction of the intraoral defects, abdominal fat can also play a major role in cases of residual defect and has good healing ability.

KEYWORDS

Squamous Cell Carcinoma(SCC), Nasolabial flap, Abdominal Fat

INTRODUCTION

A number of options are available for the reconstruction of the defects of the oral cavity after resection of the cancer, such as pectoralis major flap, radial artery forearm flap, nasolabial flap, buccal fat pad and others.^[1,2] Here we present a case report of a patient of carcinoma of the right buccal mucosa, which was resected surgically under general anaesthesia and the defect was reconstructed using a combination of inferiorly based nasolabial flap, and the abdominal fat which was used for the reconstruction of residual defect.

CASE REPORT

A 28 year old male patient reported to our department with a complaint of non-healing ulcer on the right side of the mouth since one and a half month. The ulcer had gradually increased in size and had become painful. On intraoral examination, a white ulceroproliferative lesion measuring 1cm x 1.5cm could be seen on the right buccal mucosa, extending anteriorly from the buccal mucosa opposite to upper and lower right second molars to the anterior aspect of retromolar area posteriorly and superiorly from 1cm below the upper gingival sulcus to 0.5cm above the lower gingival sulcus inferiorly (Fig.1). It was firm and tender to palpation. Mouth opening of the patient was found to be 31mm (Fig.2).



Fig.1a: Preoperative Photograph Of The Lesion.



Fig.2: Preoperative Mouth Opening.

No lymph nodes were palpable on the cervical region. The patient did not have any systemic disease. Habit of tobacco chewing was reported since five years. Incisional biopsy was done and the histological slide showed the tumor composed of cells arranged in sheets in a fibrotic stroma enclosing keratin pearls (Fig.3a). The tumor cells were found to be squamous, with moderate amount of eosinophilic cytoplasm, hyperchromatic nucleolus, showing moderate pleomorphism and frequent metastasis. The overlying mucosa was ulcerated and covered with fibrin and acute inflammatory exudates. It was reported to be moderately differentiated squamous cell carcinoma. Computed Tomography imaging (Fig.3b) further confirmed it as the squamous cell carcinoma of the right buccal mucosa. The positron emission tomography-CT showed regional metastasis in the levels I, II and III, but there was no distant metastasis.

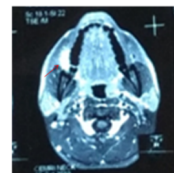
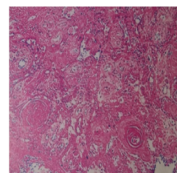


Fig.3a: Histological features of moderately differentiated the squamous cell. **b:** Computed Tomography Scanning showing carcinoma of the right buccal mucosa

Wide local excision of the tumor was done under general anaesthesia (Fig.4a,b). Supraomohyoid neck dissection was performed on the ipsilateral side for removing the lymph nodes from level I-III. For evaluation of the tumor margin and regional neck metastasis at the time of surgery, frozen section diagnosis was examined which showed the margins to be negative for malignancy.

Thereafter, we proceeded for reconstruction of the defect using

the nasolabial flap from the ipsilateral side. Marking for an inferiorly based nasolabial flap was made (Fig.5a). Incision was made along the marked outline. The width/length ratio required in our case was kept as just 1:2. The flap was elevated by keeping it superficial to the underlying facial musculature. Brisk bleeding encountered from the branches of the nasolabial artery was controlled by clamping and ligation of the vessels. The flap was then rotated anteroinferiorly and passed intraorally through the tunnel created, to reconstruct the defect created on the buccal mucosa after resection of cancer (Fig.5b).

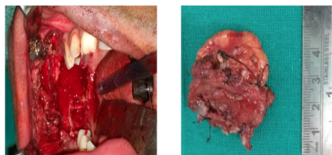


Fig. 4a: Defect on the buccal mucosa after wide local enexcision of cancer. **b:** Excised specimen

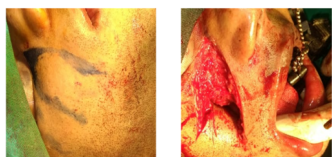


Fig.5a: Marking for the inferiorly based nasolabial flap. **b:** Flap being rotated anteroinferiorly and passed intraorally through the tunnel to reconstruct the defect.

Because of insufficient length of the flap, adequate coverage of the defect could not be achieved using the nasolabial flap alone. The residual defect was therefore reconstructed with the help of abdominal fat (Fig.6a). It was sutured to the nasolabial flap as well as the margins of the residual defect (Fig.6b). Thereafter the donor sites were closed (Fig.6c,d).



Fig.6a: Harvesting of the abdominal fat. **b:** Harvested abdominal fat. **d:** Combination of the nasolabial flap and abdominal fat to reconstruct the defect. **c:** Sutured donor site of abdominal fat. **d:** Sutured donor site for nasolabial flap.

The postoperative result was satisfactory. Flap started to show good healing (Fig.7a,b). However, the mouth opening on the immediate follow-up was found to be only 20mm. On the 5th postoperative day the patient had developed a sialocele due to excessive saliva oozing on the operated site because of the damage to the Stensen's duct, which accumulated to result in a large swelling on the lower right side of the face. It was managed by draining with the help of a wide bore needle that was placed on the most dependent part of the swelling, and the injection glycopyrrolate was also given to the patient twice a day for two days. Also the patient was sent for radiotherapy after being discharged. Thereafter the leakage of saliva did not occur.

The flap healed well and there were no functional or cosmetic disturbances reported by the patient (Fig.8a,b). As the flap healed,

the patient also regained normal mouth opening (Fig.9). No postoperative complications like fat flap, necrosis of the flap or oro-cutaneous fistula occurred and hence no second stage surgery was required.



Fig.7a: Intraoral view of the flap at immediate follow-up. **b:** Intraoral view of the flap at one week follow-up.



Fig.8a: Intraoral view showing the healed flap at 4th month follow-up. **b:** Extraoral view showing excellent cosmetic result at 4th month follow-up.



Fig.9: Mouth opening at 4th month follow-up.

DISCUSSION

The nasolabial flaps have become an ideal choice for reconstruction of the small intraoral defects.^[2,3] Inferiorly based flaps are suitable for reconstruction of the lip, commissures of the mouth, and the anterior aspect of the floor of the mouth, while the superiorly based flaps can be used for the reconstruction of the defects in the cheek region, lower eyelids, ala of the nose as well as the nasal tip. We used inferiorly based nasolabial flap for reconstruction of the defect of the buccal mucosa. The pedicle can be chosen according to the site of the defect and the requirement for rotation or advancement of the tissue to the site of defect.^[4] The thickness of the flap can be according to the size of the defect and the thickness of the donor tissues. It is versatile with abundant blood supply and has minimal donor site morbidity and complications.^[5,6,7] According to Cummings^[8], facial artery is considered to be the dominant blood supply to the nasolabial flap and he has described it as axial flap. Other authors have also suggested that major vessels contributing to the subcutaneous arterial network are the facial as well as transverse facial arteries^[9,10]. It also has anastomotic contributions from the contralateral superior and inferior labial vessels. The contributions made by vessels other than the facial artery can be appreciated by the fact that the nasolabial flap can be successfully utilized even after ligation of the ipsilateral facial artery.^[11,12] Birt and Gruss^[12] described the facial artery itself as entering the base of the nasolabial flap but they have not mentioned whether the sacrifice of perioral and perinasal muscles was required during elevation. Hynes and Boyd in their series of dissections have shown that the facial artery courses deep to the facial mimetic muscles^[7]. If the artery is included as part of the nasolabial flap, it would be mandatory to include the facial muscles lying superficial to it. Hence they consider it as random and not containing a named axial vessel. Hagan and Walder^[6] believed that including the facial muscles in the flap would increase the reliability of the flap. Hynes and Boyd^[7] do not consider this necessary because of the two reasons. Firstly, flap reliability is ensured by the inherent

properties of the dermosubdermal plexus. Secondly, including the facial mimetic muscles in the flap would affect the facial expression as well as oral continence of the patient. In our case we raised a supramuscular nasolabial flap. Also because of the support from the use of abdominal fat we did not need to include the underlying facial muscles into the flap.

Rotating the elevated distal part of the nasolabial flap to fill the surgical defect often results in limitation of the available length of the flap because the skin at the root of the nose near the medial canthus has little flexibility to allow closure. This can result in incomplete coverage of the defect. The width/length ratio can be as much as 1:5. However, in our case it was only 1:2, thus making the available length for reconstruction more limited. Autologous abdominal fat used to reconstruct the residual defect turned up to be of great help, allowing the procedure to be done with minimal use of the nasolabial flap, thus resulting in good esthetic and functional outcomes without any donor site morbidity. Other parts of the body from which the autogenous fat can be harvested include the buttocks, the lower femoral region, and the interior side of the upper thighs^[13].

Adipose tissues can have an inductive effect in healing because they cause proliferation and migration of cells that are involved in wound closure. Mesenchymal stem cells in adipose tissues have almost all the growth factors that participate in induction of cell activation, proliferation and migration, especially in the early phase of wound healing. These growth factors are keratinocyte growth factor, hepatocyte growth factor, epidermal growth factor, members of the vascular endothelial growth factor (VEGF) family, basic fibroblast growth factor (bFGF), platelet-derived growth factor-BB, insulin-like growth factor-I and key enzymes such as matrix metallothioneine-9 (MMP-9) and others^[14,15].

Apart from nasolabial flaps, the other treatment options available include pectoralis major flap, radial artery forearm flap, buccal fat pad and others. Nasolabial flap has a greater esthetic value than these. Also, we did not use the locally available buccal fat pad to close the defect because it would not be sufficient to cover the defect that was present. Also we felt that the combination of nasolabial flap and buccal fat pad taken from the the same side would only exaggerate donor site morbidity. Hence we preferred a distant site for the flap harvest. The formation of sialoceles that occurred in our case was managed by draining the saliva using a wide bore needle, injecting glycopyrrolate and then sending the patient for radiotherapy^[16] that also turned up to be beneficial in this regard. Other option available for the repair of parotid duct is the use of indwelling stent in the form of vein grafts, stiff iodine catgut, fusiform bougie, urethral catheter, vitallium wire, horse hair suture, and silk worm gut^[17].

CONCLUSION

Though the nasolabial flap is a good alternative for reconstruction of the intraoral defects of the oral cavity, autologous fat graft can also play a major role in cases of residual defect and has good healing capability. The craniofacial reconstruction in oncologic patients using the autologous fat graft must be attempted to further check their efficacy which is expected to be excellent with minimal donor site morbidity.

Funding: None

Ethical: The work done is in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki)

Conflict Of Interests: The authors declare that they do not have any conflict of interest

Patient Consent: Written informed consent was obtained.

REFERENCES

- Kolokythas A. Long-term surgical complications in the oral cancer patient: a comprehensive review. Part II. Journal of oral & maxillofacial research. 2010 Jul;1(3).
- Atkins Jr JP, Keane WM, Fassett RL. Nasolabial flap reconstruction of the anterior floor of the mouth. Transactions-Pennsylvania Academy of Ophthalmology and Otolaryngology. 1977;30(2):170.
- Ikeda C, Katakura A, Yamamoto N, Kamiyama I, Shibahara T, Onoda N, Tamura H. Nasolabial flap reconstruction of floor of mouth. The Bulletin of Tokyo Dental College. 2007;48(4):187-92.
- Ducic Y, Burys M. Nasolabial flap reconstruction of oral cavity defects: a report of 18 cases. Journal of oral and maxillofacial surgery. 2000 Oct 1;58(10):1104-8.
- Hagan WE. Nasolabial musculocutaneous flap in reconstruction of oral defects. The Laryngoscope. 1986 Aug;96(8):840-5.

- Hagan WE, Walder LB. The nasolabial musculocutaneous flap: clinical and anatomical correlations. The Laryngoscope. 1988 Mar;98(3):341-6.
- Hynes B, Boyd JB. The nasolabial flap: Axial or random?. Archives of Otolaryngology-Head & Neck Surgery. 1988 Dec 1;114(12):1389-91.
- Cummings CW. Otolaryngology: Head and Neck Surgery. St Louis, CV Mosby Co, 1986.
- Mutimer KL, Poole MD. A review of nasolabial flaps for intra-oral defects. British journal of plastic surgery. 1987 Sep 1;40(5):472-7.
- Cormick GC, Lamberty BG. The Arterial Anatomy of Skin Flaps. New York, Churchill Livingstone Inc, 1986.
- Cohen IK, Theogaraj SD. Nasolabial flap reconstruction of the floor of the mouth after extirpation of oral cancer. The American Journal of Surgery. 1975 Oct 1;130(4):479-80.
- Birt BD, Gruss JS. Intra-oral reconstruction using the nasolabial flap. The Journal of otolaryngology. 1985 Aug;14(4):233-6.
- Drochioici CI, Sulea D, Timofte D, Mocanu V, Popescu E, Costan VV. Autologous Fat Grafting for Craniofacial Reconstruction in Oncologic Patients. Medicina. 2019 Oct;55(10):655.
- López JF, Sarkanen JR, Huttala O, Kaartinen IS, Kuokkanen HO, Ylikomi T. Adipose tissue extract shows potential for wound healing: in vitro proliferation and migration of cell types contributing to wound healing in the presence of adipose tissue preparation and platelet-rich plasma. Cytotechnology. 2018 Aug 1;70(4):193-204.
- Kim BS, Debye B, Beier JP. Adipose-derived stem cells in cutaneous wound repair.
- Kulyapina A, Lopez-de-Atalaya J, Ochandiano-Caicoya S, Navarro-Cuellar C, Navarro-Vila C. Iatrogenic salivary duct injury in head and neck cancer patients: report of four cases and review of the literature. Journal of clinical and experimental dentistry. 2014 Jul;6(3):e291.
- SR K, Hiremath V, Patil AG, Aparna S. Surgical management of Stenson's duct injury using epidural catheter: A novel technique. Nigerian journal of clinical practice. 2013;16(2):266-8.