

Pedicled Forehead Flap for Reconstruction of Cheek Defect: A Novel Surgical Case Report

SENTHIL KUMAR¹, RINKU GEORGE², DAVIDSON RAJIAH³, DEEPAK CHANDRASEKARAN⁴, PRADEEP⁵



ABSTRACT

Oral cancers are considered slow killer disease. Every year 3,00,000 cases are diagnosed worldwide. Public awareness has been a great challenge to educate people to avoid harmful oral habits to prevent oral cancer. People are not aware about life threatening complications such as death due to oral cancer. Oral cancer is the eighth most common malignancy in India and third most common malignancy in South East Asia. Buccal mucosa carcinoma spreads rapidly and invades deeply to underlying tissues and has high recurrence rate. Surgical resection is more challenging if the tumour invade adjacent anatomical structures and reconstruction should be planned according to extent of tumour resection. Regional flaps are used for oral cavity after tumour resection such as radial forearm flap, deltopectoral flap, pectoralis major flap, latissimus dorsi flap, transverse rectus abdominis myocutaneous flap, trapezius flap. In this case report of a 46-year-old female, folded forehead pedicle flap was used to provide both inner and outer linings of the cheek defect following buccal mucosa tumour resection.

Keywords: Buccal mucosa carcinoma, Excision, Lip reconstruction, Transpositional flap

CASE REPORT

A 46-year-old female reported to the hospital at Chennai with the chief complaint of an ulcer in the left corner of the mouth for past one month [Table/Fig-1]. History revealed she was a pan chewer for four years. No other relevant past medical, dental history was reported. On clinical examination, there was an ulcerative proliferative growth in left buccal mucosa not involving buccal sulcus of maxillary and mandibular vestibular region. On palpation the ulcer was measuring 4x2 cm in diameter extended anteriorly left commissure of the mouth and skin of the cheek was also involved [Table/Fig-2]. There was no clinical lymph nodes enlargement in submental, submandibular, cervical regions. Clinical staging was stage 2 [T2 N0 M0]. Radiographic investigations were done to see extent of the tumour and local metastasis to adjacent vital structures and cervical lymph nodes status were assessed.

Incisional biopsy was performed and report suggested well differentiated Squamous Cell Carcinoma (SCC) of left buccal mucosa.

Surgery was planned first and it was decided to do wide local excision followed by selective neck dissection up to I-III lymph nodes level and followed by chemo-radiotherapy.

Surgical Procedure

Under nasoendotracheal intubation the patient was painted and draped. Low level apron incision for modified radical neck dissection type 3 was marked at left lateral side of the neck [Table/Fig-3].

Neck dissection was completed to preserve the Sternocleidomastoid Muscle (SCM), Internal Jugular Vein (IJV), Spinal Accessory Nerve (SAN), and level 1, 2, 3, 4 fibro fatty tissue removed along the IJV [Table/Fig-4-11] Forehead pedicled flap was harvested and delicately mobilised. Skin incision was marked for forehead pedicle flap [Table/Fig-12]. The periosteum of the forehead was intact on the frontalbone [Table/Fig-13].

The forehead pedicled flap was mobilised without periosteum medial to zygomatic arch towards left cheek side under the skin, subcutaneous layer of left cheek, so that skin of the pedicle forehead flap reconstructed the left buccal mucosa [Table/Fig-14,15]. End of the forehead flap was folded and reconstructed the left commissure of the mouth [Table/Fig-15,16].

Split skin graft was taken from the right thigh anterior skin surface and used to cover the exposed raw surface on the forehead region on the periosteum of the frontal bone. Raw surface on the thigh region was



[Table/Fig-1]: Carcinoma involving left commissure of the mouth.

[Table/Fig-2]: Ulceroproliferative growth in left buccal mucosa measuring 4x2 cm not involving maxillary and mandibular vestibule. (Images from left to right)



[Table/Fig-3]: Low level apron incision marked at left lateral side of the neck for modified neck dissection type III. **[Table/Fig-4]:** Subplatysmal plane preserving external jugular vein, marginal mandibular nerve. **[Table/Fig-5]:** Subplatysmal plane elevation. (Images from left to right)



[Table/Fig-6]: Level I, II, III, IV lymph nodes removed, internal jugular vein, sternocleidomastoid seen. **[Table/Fig-7]:** Closure with 2-0 ethilon. **[Table/Fig-8]:** Around 1 cm clearance given on the lesion at left side buccal mucosa. (Images from left to right)



[Table/Fig-9]: Around 1 cm clearance of the lesion at left corner of the mouth. **[Table/Fig-10]:** Tumour excised, one-third of upper lip and lower lip sacrificed. **[Table/Fig-11]:** Buccal fat pad seen after wide local excision. (Images from left to right)



[Table/Fig-12]: Skin incision marked for forehead pedicle flap. **[Table/Fig-13]:** Pedicled forehead flap elevated and the left the intact periosteum on the frontal bone now ready for tunneled under zygomatic arch. **[Table/Fig-14]:** After tunneled the forehead pedicle flap brought back to left commissure defect for reconstruction. (Images from left to right)

covered with chlorhexidine mesh dressing [Table/Fig-17]. Split Skin Graft (SSG) was sutured to skin of the forehead with 3-0 vicryl [Table/Fig-18]. Excisional biopsy reported moderately differentiated SCC with no lymphovascular invasion, perineural invasion [Table/Fig-19,20]. Patient was followed-up to three years [Table/Fig-21]. Postoperative period of three years showed satisfactory wound healing with

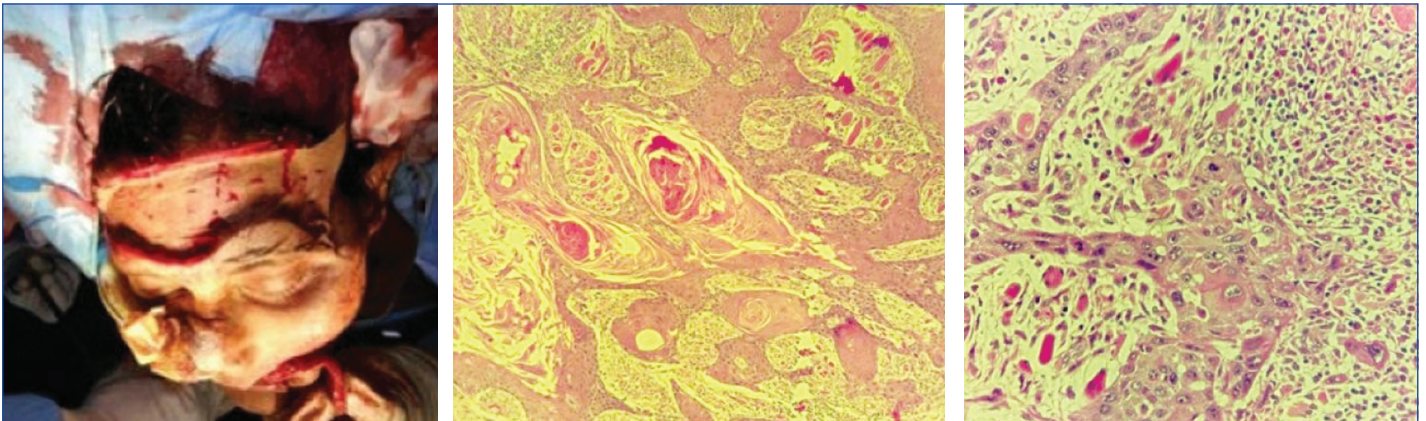
acceptable esthetic appearance of the left corner of the mouth [Table/Fig-22,23].

DISCUSSION

Oral carcinoma is the most common in head and neck carcinomas. Oral cancer surgery followed by reconstruction has always been a



[Table/Fig-15]: Forehead pedicle flap folded to recreate upper lip one-third and lower lip one-third portion of left commissure defect. **[Table/Fig-16]:** Forehead pedicle flap sutured to cheek skin to recreate left upper one-third and lower one-third of lip and commissure of the mouth and anterior part of the cheek. **[Table/Fig-17]:** Split skin graft taken from the anterior surface of the thigh for recipient site on forehead. (Images from left to right)



[Table/Fig-18]: Split skin graft sutured it to the forehead recipient site. **[Table/Fig-19]:** Histopathological image with low magnification (10X). **[Table/Fig-20]:** Histopathological image with high magnification (40X).



[Table/Fig-21]: Postoperative day three follow-up, positive prick test. **[Table/Fig-22]:** Post operation three years follow-up. Natural merging of forehead pedicle flap with cheek skin and reconstructed the left commissure of the mouth. **[Table/Fig-23]:** Postoperative, three years follow-up intraoral view showed complete healing of skin of the forehead flap became left side of the buccal mucosa. (Images from left to right)

challenge for the treating surgeons with selection of pedicle local or regional flap. Different types of pedicle flaps and microvascular free flaps have been used for reconstruction of full thickness cheek defects (through-and-through defect) such as pedicled folded forehead flap, double faced pectoralis major flap, folded trapezius island myocutaneous flap, folded submental island flap, double continuous radial forearm flap, and chimeric anterolateral thigh flap [1]. We cannot select free flaps due to high technique sensitivity, time consuming, long period of postoperative care and also esthetic problems such as bulkiness, colour, texture mismatch in contrast loco regional flaps have reduced susceptibility to infection, thrombosis [2]. So, locoregional pedicle forehead flap was easier to harvest and transfer. Reconstruction of Pectoralis Major Myocutaneous Flap (PMMC) in female patients has been reported with adeno carcinoma developed from the breast tissue [1]. In this case report, the patient was a young female patient who needed

aesthetic and functional rehabilitation, hence it forehead pedicle flap was chosen as mode of treatment.

The size of the buccal mucosa tumour and defect caused by surgery determine reconstructive options for a particular patient. Small lesions up to 2 cm closed primarily. Very superficial lesions can be skin grafted or left to heal by secondary intention. Larger defects such as buccal mucosa defect from upper to lower gingivobuccal sulcus with or without alveolectomy needs regional flap like pedicle forehead flap [3]. Forehead is the site where anastomosis of supra orbital, supra trochlear arteries at lateral orbital rim and one side the Frontal Branch of Superior Temporal Artery (FBSTA) enters 75% of the cases at middle and inferior thirds of the forehead [4]. The forehead is a reliable option because of its dependability and anatomic similarities with the nose and other facial parts, so it was used for reconstruction and also given its ideal colour and texture

where other regional local flaps and free grafts would have been inadequate [5]. So, pedicle forehead flap was selected as treatment option for her. The main function of the oral cavity is mastication, speech, deglutition, salivary secretion, so the goal of reconstruction after oral cancer ablative surgery is to restore functions [6]. Full thickness cheek defects (through-and-through) involved both oral lining and external facial skin had been planned in this case report and selected pedicle flap for particular clinical situation.

The superficial temporal arteries, supratrochlear arteries and the supraorbital arteries were three main vessels supply forehead [7].

Chummuna S et al., reviewed 501 cases undergoing Radical Neck Dissection (RND) for SCC of oral cavity and observed 78% of most metastasis were contained to level I-III with only 20% of the patients having metastasis to level IV and 2% spreads to level -V and never occurred in the absence of palpable metastasis in other levels of neck [8]. Based on this study, it was decided to perform modified neck dissection from level I-III including the primary tumour excision with 1 cm margin and sent to histopathological examination. The excisional biopsy report confirmed moderately differentiated squamous cell carcinoma of left buccal mucosa and revealed all the cervical lymph nodes from level I-III free of tumour.

Latissimus Dorsi Flap (LDF) may appear less aesthetic because of its large volume, so it was decided not to select LDF in the present case [9]. Different pedicle flaps used for through and through surgical defect caused by resection of oral cavity has been proposed such as radial forearm free flap, deltopectoral, pectoralis major, latissimus dorsi free, transverse rectus abdominis myocutaneous and trapezius myocutaneous flaps, sub mental flap, platysmal flap [9].

The PMMC was not performed as breast deforming effects can occur in adolescent female patients because of PMMC flap harvest [10].

Blood supply and venous drainage of a Platysmal Flap (PF). PF are uncertain, which may lead to partial or total necrosis and submandibular lymph nodes metastasis may preclude the use of PF, and if positive lymph nodes are suspected before, or are identified during surgery, a PF is not recommended. Therefore, it was not selected as the treatment of choice in this case [10].

Radial Free Forearm Flap (RFFF) is a popular pedicle flap for soft tissue defects described by Fang QG et al., in 1981. It needs more surgeon experience and more technical sensitivity and more costly [10]. Delto Pectoral flap (DP) has a limited role due to the introduction of other regional or distant tissue transfer flaps, so not the best choice for flap facial, oral and pharyngeal reconstruction [11]. A unique feature of the rectus abdominis flap is that a substantial amount of muscle and skin can be harvested and more bulk needed [11]. In the present case, we needed less bulk of soft tissues required to reconstruct left corner of mouth and less width needed for lip reconstruction so it was not selected as the treatment of choice.

Submental flap can have some disadvantages when used for intraoral reconstruction including the thickness of the flap, hair-bearing nature of the region in male patients, marginal mandibular nerve paresis, and increased regional lymph nodes metastasis [11]. So, it was not selected for reconstruction in the present case.

To perform a trapizeus flap, the patient should be placed in lateral decubitus position for flap harvest, which is a major disadvantage during reconstruction [11]. The ideal candidate for a forehead flap is bald and there can sometimes be problems of recipient site hair growth. Depilation can be performed for management of intra oral hairs, however, in some cases there still may be undesirable hair growth [12].

CONCLUSION(S)

In recent practice locoregional flap is playing major role where micro vascular free tissue transfer is not possible. Pedicled forehead flap is easy to harvest, does not require patient repositioning and provides excellent skin colour match around the mouth. In conclusion, pedicled forehead flap remains a reliable option in reconstruction of cheek defects following wide local excision of buccal mucosa carcinoma in female patient.

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PARTICULARS OF CONTRIBUTORS:

1. Senior Assistant Professor, Department of Oral and Maxillofacial Surgery, Tamil Nadu Government Dental College and Hospital, Chennai, Tamil Nadu, India.
2. Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospital, Chennai, Tamil Nadu, India.
3. Senior Assistant Professor, Department of Oral and Maxillofacial Surgery, Tamil Nadu Government Dental College and Hospital, Chennai, Tamil Nadu, India.
4. Associate Professor, Department of Oral and Maxillofacial Surgery, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education, Chennai, Tamil Nadu, India.
5. Assistant Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospital, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Senthil Kumar,
House No: 3, First Floor, Rajive Gandhi Nagar, South Mada Street Extension,
Villivakkam, Chennai-600049, Tamil Nadu, India.
E-mail: drsenthilkumaromfs@gmail.com

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