

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Immediate Reconstruction of Squamous Cell Buccal Mucosal Cancer Surgical Ablation Defects by Pedicled Loco Regional Flaps at Low Resource Settings.

Gopinathan Sivasankaran*.

Dept Of Surgical Oncology, Father Muller Medical College, Mangalore, Karnataka, India.

ABSTRACT

Buccal mucosal cancer is among the top three types of cancers in India.. The gold standard management of Buccal mucosal cancer is surgical ablation. It is a surgical challenge to perform reconstruction as structure; function and esthetics have to be restored. Various Pedicled based loco regional flaps commonly used are delto pectoral flap, PMMC flap, Naso labial flap, forehead flap. This prospective study describes immediate reconstruction of Squamous cell Buccal mucosal cancer surgical ablation defects by Pedicled loco regional flaps at low resource settings. The current prospective study was conducted in the Department of Surgical Oncology at tertiary health care centre. Detailed clinical history and examination of the patients were recorded. Staging work up done with CECT head and neck, X ray chest, USG abdomen and Liver function tests. Reconstruction was made with PMMC flap, Naso labial flap, Delto pectoral flap, Forehead flapter primary tumour excision. Outcome of the surgery with complications, cosmetic and functional outcomes were noted. Total number of Buccal mucosa cancer included in our study is 80 and all patients underwent reconstruction by loco regional flaps. In our study, Majority (56.9%) underwent PMMC flap reconstruction followed by Deltopectoral flap (21.5%). Cosmetic outcome and Functional outcome are comparable with all Pedicled flap. Immediate loco regional flap Reconstruction of Buccal mucosal cancer post surgical ablation defects are challenging due to their complex three dimensional natures. Loco Regional Pedicled flap is the ideal choice of reconstruction in low resource settings

Keywords: Squamous Cell, Buccal mucosal, cancer.

**Corresponding author*

INTRODUCTION

Buccal mucosal cancer is among the top three types of cancers in India [1]. In India, 20 per 100000 populations are affected by oral cancer which accounts for about 30% of all types of cancer [2]. Over 5 people in India die every hour everyday because of oral cancer (3).

Buccal mucosa cancer is a major sub site for oral squamous cell carcinoma (SCC) in the Indian subcontinent, and these tumors are known to comeback loco regionally following adequate treatment [4, 5].

The gold standard management of Buccal mucosal cancer is surgical ablation which creates sometimes large complex defects. Defects resulting from surgical ablation constitute major functional and esthetic reconstructive challenges (6, 7) Buccal mucosal cancer surgical defect reconstruction has improved with the better knowledge and techniques. It is a surgical challenge to perform reconstruction as structure; function and esthetics have to be restored (8) Reconstructive options for Surgical defects are regional flaps to loco regional flaps to micro vascular free flaps.

Various Pedicled based loco regional flaps commonly used are delto pectoral flap, PMMC (Pectoralis Major Myo Cutaneous) flap, Naso labial flap, forehead flap (6, 9) PMMC flap was first described by Stephen Ariyan in 1979 (8,10,11,12,13).The pectoralis major myo cutaneous flap is a work horse flap and commonly used flap for oral cavity reconstruction. This flap easily accepts the challenge of reconstruction in extensive intra and extra oral defect (8,14,15,16) . To avoid the bulkiness associated with the flap the pectoralis major may be used as a muscle flap with or without skin grafting (17,18).

The first reported use of the Naso labial flap for the closure of an oral cavity defect by trans buccal transfer was by Theirsch [19]. The skin of the Naso labial fold is nourished by the supero labial and Alar branches of the facial artery. It is commonly used for small defects in the lip, Buccal mucosa, floor of the mouth (20)

In the 1950s, defects were repaired using a forehead flap or temporal flap combined with split-thickness skin graft (21) Forehead flaps are based on the robust vasculature to the forehead via the supraorbital, supratrochlear, and terminal branches of the angular and dorsal nasal vessels.

In 1965, Bakamjian first described the deltopectoral flap(DP)(22) This flap is a pedicled axial fasciocutaneous flap based on the internal mammary artery perforator arteries (IMAP)

This prospective study describes immediate reconstruction of Squamous cell Buccal mucosal cancer surgical ablation defects by Pedicled loco regional flaps at low resource settings.

MATERIALS AND METHODS

The current prospective study was conducted in the Department of Surgical Oncology at tertiary health care centre from the January 2014 to June 2017. Each patient was informed and consent was taken to participate in the study.

Exclusion criteria

- Patient underwent primary closure, skin graft after resection
- Free flap reconstruction
- Patient underwent Neoadjuvant chemotherapy
- Metastatic disease

Inclusion criteria

Patient eligible for the analysis were those underwent composite resection with an immediate reconstruction with use of PMMC flap, Naso labial flap, Deltopectoral flap, Forehead flap

Detailed clinical history and examination of the patients were recorded. Staging work up done with CECT head and neck, X ray chest, USG abdomen and Liver function tests.

Procedure was performed are wide local excision of primary with or without Manibulectomy (Marginal, Segmental or Hemi) with modified radical neck dissection as per standard protocol. Reconstruction was made with PMMC flap, Naso labial flap, Delto pectoral flap, Forehead flap.

Full aseptic precautions were made during the procedure.

Outcome of the surgery with complications, cosmetic and functional outcomes were noted. A complication of the procedure divides into early and late. Early complications are Hematoma, Seroma, and wound infection, wound dehiscence, drooling of saliva, Oro cutaneous fistula. Late complications are Trismus, shoulder dysfunction and Parasthesia of the neck.

Cosmetic outcome are divided into excellent, satisfied and fair .Functional outcome are divided into Excellent, satisfied and fair.

Recurrences are divided into local, systemic and both Data was compiled in MS Excel and checked for its completeness and correctness. Then it was analyzed.

RESULTS

Total number of Buccal mucosa cancer included in our study is 80 and all patients underwent reconstruction by loco regional flaps. 51 patients (60%) belong to 40 -50years and male predominance (49 patients)(Table 1).

All patients are squamous cell carcinoma with majority are grade 2 (60%). 43 patients (53.9%) are stage 4 (T4a or N2) group and Majority are tumour size more than 4cm(Table2).

In our study, Majority (56.9%) underwent PMMC flap reconstruction followed by Deltopectoral flap (21.5%) . (Table3).

Major site of reconstruction are mucosa with Mandible (43.8%) followed by mucosa, mandible and skin (26.9%)(Table3).

Early complications like Hematoma, Seroma, wound infection, wound dehiscence, Drooling of saliva, Oro cutaneous fistula are common with all Pedicled flap. Late complications like Trismus, shoulder dysfunction and Parasthesia of the neck are less common with PMMC flap (Table4)

Cosmetic outcome and Functional outcome are comparable with pedicled flap(Table 5,6) Among the recurrences, 11 patients (8.5%) had local recurrence,5 patients(3.8%) had systemic (Lung) recurrence and 2 patients(1.5%)both local recurrence and systemic recurrence(Table7)

Table 1: Patients Characteristics

a. Age		
	Number	Percentage(%)
<40yrs	15	18.8%
40-50yrs	51	63.8%
>50yrs	14	17.4%
b. Sex		
Male	49	61.3%
Female	31	38.7%

Table 2: Tumor Characteristics

a. Grades		
Grade1	12	15.0%
Grade2	48	60.0%
Grade3	20	25.0%
b. Stage		
Stage 1	03	03.6%
Stage2	08	10.0%
Stage3	26	32.5%
Stage 4	43	53.9%

Table 3: Reconstruction Characteristics

a. Type Of reconstruction		
	Number	Percentage
A. PMMC Flap	41	51.3%
B. Naso labial flap	03	03.6%
C. Delto pectoral flap	30	37.6%
D. Forehead flap	06	07.5%
b. Site of reconstruction:		
Only mucosa	11	13.8%
Mucosa + bone	35	43.8%
Mucosa + skin	09	11.3%
Mucosa + skin + bone	25	31.3%

Table 4: Post Operative Complications

a. Early				
	PMMC flap	Nasolabial flap	Deltopectoral flap	Forehead flap
Hematoma(10)	08	00	07	01
Infection(08)	06	00	07	01
Wound dehiscence(14)	11	01	05	01
Seroma(26)	21	02	10	02
Drooling of saliva(20)	15	01	11	02
Partial flap loss(23)	17	01	10	03
Total flap loss(02)	01	00	01	00
Oro cutaneous fistula(08)	06	00	03	01
b. Late				
Trismus(08)	07	00	07	00
Parasthesia of neck(15)	11	00	11	06
Shoulder dysfunction(16)	16	00	11	00

Table 5 : Cosmesis

	PMMC flap(41)	Nasolabial flap(03)	Deltpectoral flap(30)	Forehead flap(06)
Excellent (19)	07	01	10	01
Satisfied(42)	27	01	11	03
Fair (19)	07	01	09	02

Table 6: Functional Outcome

	PMMC flap(41)	Nasolabial flap(03)	Deltpectoral flap(30)	Forehead flap(06)
Excellent (19)	10	01	07	01
Satisfied(40)	21	01	15	03
Fair(21)	10	01	08	02

Table 7: Recurrence

	Number	%
Local only	07	08.5%
Systemic only	04	03.8%
Local + Systemic	02	01.5%

DISCUSSION

In India, the incidence of oral cavity cancers, is still one of the highest in the world because tobacco products are easily available and the lack of awareness in the community[1].The gold standard management of Buccal mucosa tumours produce complex defects which are difficult to reconstruct. Reconstructive options are Autologous Pedicled or free flap. Micro vascular free flap not easily available in all centres due to non availability of plastic surgeons, prolonged operative time, cost .so pedicled locoregional flap are very useful at low resource settings..

In the sixth century BC, Sushruta, described the first reconstructive procedures for nasal defects by transferring skin from the forehead and the cheek(23). Since then, plenty of advancement in reconstruction of oral cavity defects..Every oral cavity operating surgeons should be familiar with the pedicled flaps..Each locoregional flap has few advantages and disadvantages.

In PMMC flap, advantages are it offers one-stage reconstruction ,Patient's position need not be changed ,it provides large cutaneous island that can be used for large defects ,The muscular part covers neck structures protecting the carotid artery. Disadvantages are can conceal recurrences .In women, the flap might include breast tissue, which may lead to breast asymmetry ,In males, hirsute chest skin is placed intraorally, loss of muscle function in arm adduction and/or rotation, overweight patients the flap is bulky, which leads to postoperative contour deformities (24).

Deltpectoral Falp, Advantages are Donor site is hidden, thus cosmetically acceptable , Excellent blood supply, with dependent venous drainage , Deltoid portion usually not hair bearing , Unilateral or bilateral can be used , Usually not delayed. Disadvantages are Staged approach, If flap is used to cover the carotid vessels, blow out of the carotid artery is a hazard if the flap fails. Failure rate is 9 to 18%,Outside radiation field (21)

McGregor Millard Wilson describes Variations of pedicle of forehead flap. Revascularization of Para median flap based on supra trochlear artery , Mid facial reconstruction - Mid fore head flap, Median Para median - Median fore head flap . Advantages are Largest area of donor site , matching color and texture , Different types due to variation in flap pedicle ,Long enough to reach any part of the ipsilateral face , 85% to 95% success ,Safest flap .Disadvantages are bad scar in the face, facial deformity(22)

Early complications like Hematoma, Seroma, Wound infection, wound dehiscence, Drooling of saliva, Oro cutaneous fistula are less common in Micro vascular flap than PMMC flap. Late complications like Trismus, shoulder dysfunction and Parasthesia of the neck more common with PMMC flap than Micro vascular flap no Valid tools to assess aesthetic and functional outcomes after reconstruction of oral cavity defects. Several studies report aesthetic and functional outcomes, in the form of an assessment by the patient, by the surgeon, or by an independent Professional. Some authors use questionnaires, whereas others use photographs to assess aesthetic outcomes.. We used assessment by patient and two surgeons. Majority of the patient were satisfied. Cosmetic outcome and Functional outcome are better with Micro vascular flap than PMMC flap may be due to bulk of the flap, loss of shoulder function Buccal mucosal cancers are loco regional disease. Most of the recurrence occurs in the primary site. Among the recurrences, 8.5% had local recurrence, 3.8% had systemic (Lung) recurrence and 1.5% both local recurrence and systemic recurrence in our study

CONCLUSION

Immediate loco regional flap Reconstruction of Buccal mucosal cancer post surgical ablation defects are challenging due to their complex three dimensional natures. Loco Regional Pedicled flap is the ideal choice of reconstruction in low resource settings.

REFERENCES

- [1] J. K. Elango, P. Gangadharan, S. Sumithra, and M. A. Kuriakose, "Trends of head and neck cancers in urban and rural India," *Asian Pacific Journal of Cancer Prevention*, vol. 7
- [2] R. Sankaranarayanan, K. Ramadas, G. Thomas et al., "Effect of screening on oral cancer mortality in Kerala, India: a cluster randomised controlled trial," *The Lancet*, vol. 365, no. 9475, pp. 1927–1933, 2005
- [3] Bhawna Gupta , Anura Ariyawardana and Newell W. Johnson "Oral cancer in India continues in epidemic proportions: evidence base and policy initiatives"*International Dental Journal* 2013; 63: 12–25
- [4] Walvekar RR, Chaukar DA, Deshpande MS, Pai PS, Chaturvedi P, Kakade A, et al. Squamous cell carcinoma of the gingivobuccal complex: Predictors of locoregional failure in stage III-IV cancers. *Oral Oncol* 2009;45:135-40.
- [5] Pathak KA, Gupta S, Talole S, Khanna V, Chaturvedi P, Deshpande MS, et al. Advanced squamous cell carcinoma of lower gingivobuccal complex: Patterns of spread and failure. *Head Neck* 2005;27:597-602.
- [6] Pangam N, Thorawade V, Shah R, Jagade M, Nichalani S. Study of Surgical Management and Locoregional Flap Reconstruction in Oral Malighancies. *Journal of Dental and Medical Science*. 2014;13(5):93-6.
- [7] Rudes M, Bilic M, Jurlina M, Prgomet D. Pectoralis Major Myocutaneous Flap in the Reconstructive Surgery of the Head and Neck-Our Experience. *Coll. Antropol*. 2012;36(2):137-42.
- [8] Amin MM, Naseer U, Akhtar A, Awan AA. Pectoralis Major Myocutaneous Flap for Reconstruction of Major Neck Defects. *Journal of Surgery Pakistan*. 2014;19(2).
- [9] Deo SVS, Purkayastha J, Das D, Kar M, Srinivas G, Asthana S, et al. Reconstruction of Complex Oral Defects using Bi-Paddle Pectoralis Major Flap –Technical Modifications and Outcome in 54 Cancer Patients. *Indian Journal of Otolaryngology and Head and Neck Surgery*. 2003;55(1):5-9.
- [10] Rahamthullah US, Hussain SJ, Nasyam FA, Allareddy S. Pectoralis Major Myocutaneous Flap in Oral and Maxillofacial Reconstruction: A case Report. *J Res Adv Dent*. 2015; :1s2:64-7.
- [11] Leite AKN, Matos DLL, Belli M, Kulsar MAV, Cernea CR, Brandao LG, et al. Pectoralis Major Myocutaneous Flap for Head and Neck Reconstruction. *Acta Otorhinolaryngologica Italica*. 2014;34:389-93.
- [12] Tahir M, Tahmeedullah, Khan AT. Clinical Evaluation of Pectoralis Major Myocutaneous Flap in Head and Neck Reconstruction. *JPMI*. 2005;19(1):71-5.
- [13] Vartanian JG, Carvalho AL, Solange MT, Carvalho, Mizobe L, Magrin J, et al. Pectoralis Major and Other Myofacial/Myoutaneous Flap in Head and Neck Cancer Reconstruction: Experience with 437 Cases at a Single Institute. *Head and Neck*. 2004;1018-23.
- [14] Reddy VC, Vijaya M, Sabitha, KS, Chris DA, Mahesh K, Jagdish S. Pectoralis Major Myocutaneous (PMMC) Flap Donor Site Recurrence in a Case of Buccal Mucosal Cancer: A Case Report. *International Journal of Health Science and Research*. 2013;3(1):55-7.

- [15] Lekawale H, Patil B. Pectoralis Major Myocutaneous Flap for Oral Cavity Cancer Reconstruction - Our Experience with 30 Cases. 2012;2(3):159-61.
- [16] Sathyanarayan GR, Suresh K P, Prabhu V. Pectoralis Major Myocutaneous(PMMC) Flap for Reconstruction of oro Facial Defect. JIADS. 2011;2(2):76-8.
- [17] Rahamthullah US, Hussain SJ, Nasyam FA, Allareddy S. Pectoralis Major Myocutaneous Flap in Oral and Maxillofacial Reconstruction: A case Report. J Res Adv Dent. 2015; :1s2:64-7.
- [18] Belt PJ, Emmett J. Local Transposition Flap Repair of the Pectoralis Major Myocutaneous Flap Donor Site. Plastic and Reconstructive Surgery. 2004;114(3):732-7.
- [19] Y. Ducic, M. Burye, Nasolabial Flap reconstruction of oral cavity defects: A report of 18 cases. J.Oral Maxillofac Surg58:1104-1108, 2000]
- [20] Brian L. Schmidt, Eric J. Dierks, The Nasolabial Flap Oral Maxillofacial Surg Clin N Am 15 (2003) 487–495].
- [21] Morris M, Unhold G. Use of flaps in reconstructive surgery of the head and neck. LJ P. Principle of Oral and Maxillofacial Surgery. Philadelphia, Pa: Lippincott; 1992. 947.
- [22] Bakamjian VY. A two-stage method for pharyngoesophageal reconstruction with a primary pectoral skin flap. Plast Reconstr Surg. 1965 Aug. 36:173-84.
- [23] Whitaker IS, Karoo RO, Spyrou G, Fenton OM. The birth of plastic surgery: the story of nasal reconstruction from the Edwin Smith Papyrus to the twenty-first century. Plast Reconstr Surg. 2007. 120(1):327-36.
- [24] Milenovic A, Virag M, Uglesic V, Aljinovic-Ratkovic N. The pectoralis major flap in head and neck reconstruction: first 500 patients. J Craniomaxillofac Surg. 2006 Sep. 34(6):340-3.