

Reconstruction of Defects after Resection of Buccal Carcinoma—Our Experience

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Abstract

Original Research Article

Background: Buccal carcinoma are one of the commonest site of oral cancers whose primary treatment is surgical excision, it results in functional and aesthetic loss to patient. Microvascular reconstruction has revolutionised the reconstructive part of surgical management of head and neck cancer, but old modalities of reconstruction like locoregional flaps and grafts are still good option for oral defects. **Method:** 45 patients of buccal carcinoma were operated in our department during period of 5 yrs. Reconstructive option which were used includes nasolabial flap in 16 cases, pectoralis major myocutaneous flap in 6 cases, split thickness skin graft in 6 cases, buccal pad of fat in 3 cases, forehead flap in 2 cases, full thickness skin graft in 1 case, combined pectoralis major myocutaneous flap & deltopectoral flap in 1 case & primary closure in 10 cases. **Results:** We evaluated outcome of flaps used in reconstruction of buccal defects using functional & cosmetic scoring & complications. **Conclusion:** Microvascular surgery has revolutionized the reconstruction after ablative head and neck cancer surgeries, but locoregional flaps & grafts knowledge makes head and neck surgeon capable of delivering good patient service in setup with minimal resources and expertise.

Keywords: Buccal carcinoma, locoregional flaps, grafts, microvascular surgery.

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INTRODUCTION

In the Indian subcontinent, head and neck cancer accounts for 45 per cent of all malignancies with oral cancer being the most common type accounting for one-third of all cancers [1]. Buccal carcinoma is the commonest site of oral cavity cancer in India [2]. Squamous cell carcinoma is the most common histologic type of oral cancer [3]. Tobacco and alcohol is the main etiological factors [4] responsible for head & neck cancers.

Surgical excision of the tumor and neck dissection forms the mainstay of treatment, followed by adjuvant chemotherapy and radiotherapy. Deformities of the head and neck region can have devastating effects on appearance and function of the patient and are among the most disabling and socially isolating defects with significant impact on patient's quality of life. Reconstruction of such defects continues to be an extremely demanding challenge for surgeons who aim to restore form and function with minimal surgical morbidity.

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, locoregional flaps & grafts are still among good options available for immediate reconstruction.

Here, we are sharing our experience of reconstruction of cheek defects after buccal carcinoma excision.

MATERIAL AND METHODS

General data

45 patients of buccal carcinoma were operated in our department during period of 5 yrs, out of which 26 were male & 19 were female. Majority of patients belong to the age group of 30-50 yrs.

According to AJCC (7th edition) TNM Staging, patients were classified as given in table 1.

Table-1

TNM staging	Stage	No. of pts= 45
T1N0M0	I	4
T2N0M0	II	13
T2N1M0	III	1
T3N0M0		10
T3N1M0	IV	1
T3N2bM0		2
T4aN0M0		10
T4aN1M0		3
T4aN2bM0		1

Surgical treatment

All patients underwent surgical intervention which includes wide local excision with neck dissection followed by flap reconstruction.

23 patients underwent only wide local excision of buccal lesion sparing mandible & external skin, only in 1 one case external skin was excised, mandible was addressed in 21 cases which includes Hemimandibulectomies (3), Marginal Mandibulectomies (11) & segmental Mandibulectomies (4), Periosteal stripping (3).

Out of the 45 cases, 41 cases underwent a neck dissection (modified radical neck dissection in 26 cases,

supra omohyoid neck dissection in 14 cases & radical neck dissection in 1 case).

Reconstructive option which were used includes nasolabial flap in 16 cases, pectoralis major myocutaneous flap in 6 cases, split thickness skin graft in 6 cases, buccal pad of fat in 3 cases, forehead flap in 2 cases, full thickness skin graft in 1 case, combined pectoralis major myocutaneous flap & deltopectoral flap in 1 case & primary closure in 10 cases.

Adjuvant radiotherapy was given to 33 patients & concurrent chemoradiotherapy was given to 1 patient.

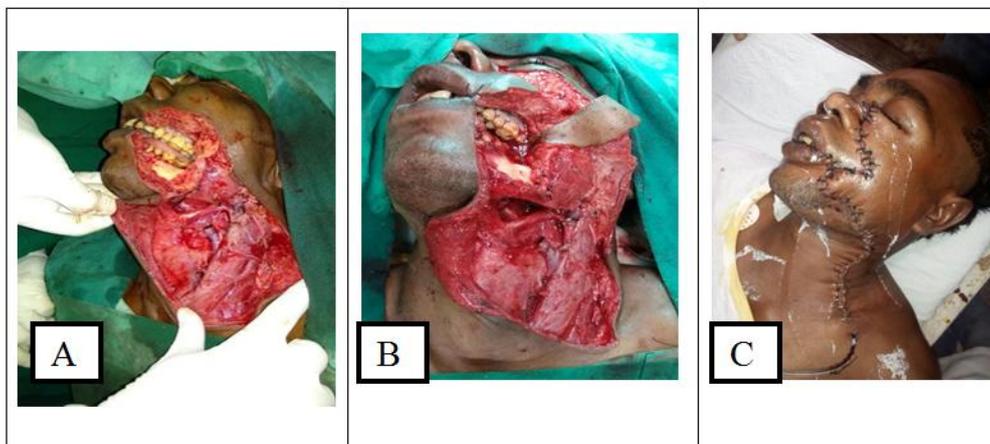


Fig-1 : (A) Intraoperative picture showing surgical excision of tumour with neck dissection , (B) Intraoperative picture showing nasolabial flap being harvested, (C) Final outlook after nasolabial flap reconstruction



Fig-2: (A) Preop picture of patient with buccal carcinoma, (B) Intraoperative picture showing forehead flap being used for reconstruction of ext skin defect, (C) Postoperative picture after flap pedicle being cut & sutured at primary site

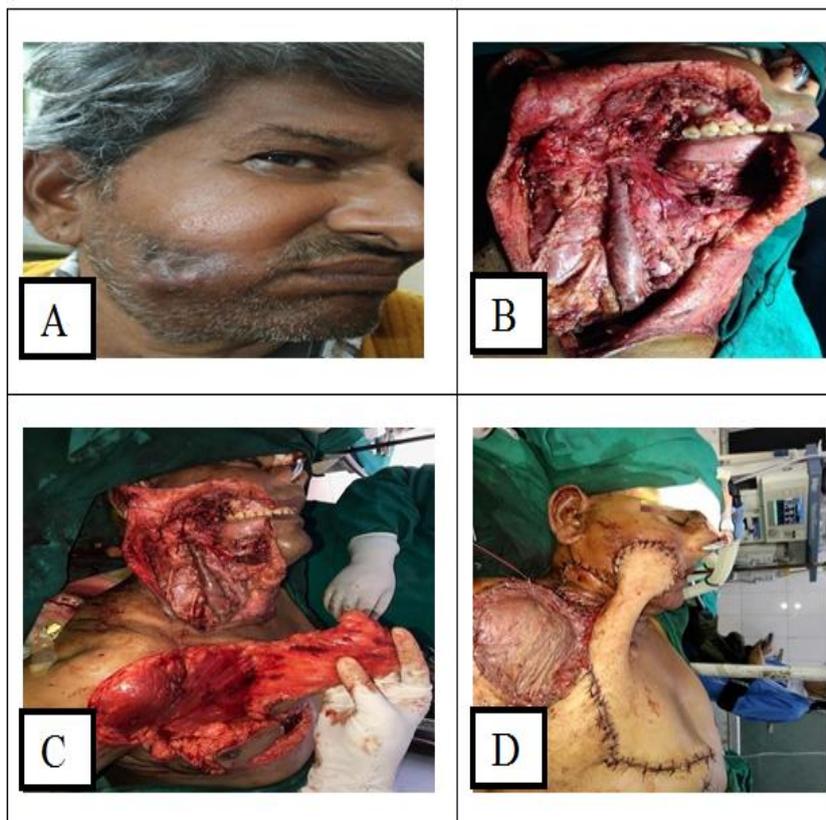


Fig-3: (A) Preoperative picture of a patient with buccal carcinoma with skin involvement, (B) Intra operative picture after surgical excision of tumour and neck dissection , (C) Intraoperative picture showing deltopectoral flap harvest , (D) Final outlook after pmmc–dp flap reconstruction



Fig-4: Postoperative pictures of patient operated for buccal carcinoma showing different grades of trismus (A) No trismus, (B) Grade I trismus, (C) Grade II trismus, (D) Grade III trismus

RESULTS

Table-2: Complications encountered after reconstruction with different modalities

Complications	Flaps used in buccal defect reconstruction						
	Pmmc flap (6)	Nasolabial flap (16)	Dp flap (1)	Forehead flap (2)	Buccal pad of fat (3)	Skin graft (7)	Primary closure (10)
Early							
Hematoma	1	2	0	0	0	0	1
Ocular edema	0	0	0	0	0	0	0
Infection	1	3	1	0	0	2	1
Wound dehiscence	1	0	0	0	0	0	0
Seroma	0	0	0	0	0	0	0
Drooling of saliva	0	4	0	0	0	0	0
Abscess	0	0	0	0	0	0	1
Lip edema	0	0	0	0	0	0	1
Late							
Partial flap loss	1	1	0	0	0	0	0
Total flap loss	2	1	1	0	0	0	0
Cosmetic defect	3	0	1	0	0	1	3
Oro cutaneous fistula	2	0	0	0	0	0	0
Trismus	6	4	1	2	0	7	0
Whistle deformity	0	2	0	0	0	0	0

Table-3: Trismus in postoperative patients (n =45)

Flaps	Grade 1 (20-30mm)	Grade 2 (10-20mm)	Grade 3 (<10mm)	No trismus
Nasolabial	3	2	0	11
Pmmc	2	3	1	0
Pmmc+dp	0	1	0	0
Fore head	0	0	2	0
Buccal pad of fat	0	0	0	3
Ftsg	0	1	0	0
Stsg	0	3	3	0
Primary closure	1	6	1	2
Total	6	16	7	16

Table-4: Cosmesis outcome (scoring) on scale of 0-10. (n=45)

	PMMC	nasolabial flap	PMMC+DP	forehead flap	buccal pad of fat	skin grafting	primary closure
good	1	6	0	0	3	0	2
satisfied	1	6	0	0	0	4	3
fair	2	2	1	2	0	0	4
poor	2	2	0	0	0	0	1

(Good = > 8 -10 , Satisfied = > 5-8 , Fair = > 2-5 , Poor = 0-2)

Table-5: Functional outcome (scoring) on scale of 0-10. (N =45)

	PMMC	nasolabial flap	PMMC+DP	forehead flap	buccal pad of fat	skin grafting	primary closure
good	0	10	0	0	0	0	2
satisfied	2	2	0	3	3	0	1
fair	3	2	1	0	0	4	6
poor	1	2	0	0	0	3	1

(Good => 8 -10, Satisfied = > 5-8, Fair => 2-5, Poor = 0-2)

DISCUSSION

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.

Nasolabial flap was originally described by Sushruta in 600 BC [6]. The nasolabial flap is an axial flap but may be utilized as a random flap [7]. The flap receives its blood supply from the angular artery (a branch of the facial artery), the infraorbital artery, and the transverse facial artery [8]. 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 [9]. Indications of nasolabial flap use includes small to moderate defects, medically compromised patients, free flap salvage surgery and reconstruction in the vessel-depleted neck. Nasolabial flap was used in 16 cases by us because of easy availability and good viability. Complications like Hematoma in 2 cases, Drooling of saliva in 5 cases,

whistle deformity in 2 cases & flap necrosis in 1 case were seen.

In 1979, Ariyan described the pedicled pectoralis major myocutaneous flap. The blood supply of the pectoralis major flap is the pectoral branches of the thoracoacromial artery. This flap offers one-stage reconstruction ,provides a large cutaneous island that can be used for defects involving 2 epithelial surfaces & covers neck structures protecting the carotid artery, especially in patients who have undergone radiation therapy. It can conceal recurrences making follow-up of the neck area more complicated. In women it might include breast tissue, which may lead to breast asymmetry & in males, hirsute chest skin is placed intraorally. In patients who are overweight, the flap is bulky, which leads to postoperative contour deformities [10].

We used PMMC in larger defects to provide inner and outer lining, it provided excellent cover individually & in combination, these flaps are suitable in advanced staged carcinoma patients with limited life expectancy, it supplies the required volume of tissue to obliterate the neck dead space. We encountered complications like hematoma in 1 case, wound dehiscens in 1 case, partial flap necrosis in 1 case, total flap necrosis in 2 cases & orocutaneous fistula in 2 cases. In terms of oral competence, speech & swallowing, it is well accepted by all patients.

In 1965, Bakamjian first described the deltopectoral flap. It is an axial pattern flap designed on the anterior chest wall between the clavical and the level of the anterior axillary fold. Its vascular supply arises from the upper three or four perforating branches of the internal mammary artery, which emerge through the medial end of the intercostals spaces. Larger amount of hairless skin is available which can be used along with myocutaneous flap to cover mucosal/skin coverage. Main disadvantages are oral fistula which can be managed conservatively or closed at second surgery & cosmetic problem at the donor site [11]. We used DP flap in one case but it got necrosed, may be due to faulty technique of flap harvesting.

The buccal fat pad is composed of lobes and highly mobile structures. It has a main body and four extensions: temporal, buccal, pterygoid, and pterygopalatine [12]. The buccal fat pad has abundant blood supplies from the maxillary artery and the superficial and deep temporal artery. There are rich capillary networks within the capsules that cover the fat pad. Arterioles enter the capsule from several directions and break up into capillary plexuses. Most of the blood from the fat pad drains into the facial vein [13]. BFP can be used in epithelialization without additional skin graft. Use of buccal fat pad reconstruction offers a simple, convenient and reliable way to reconstruct small to medium defects of the oral cavity with low morbidity & in older patients who would not be able to tolerate time-consuming flap reconstruction procedures. However its size is a limitation and repeated usage may not be possible. As the flap is fragile, damage to the vascular pedicle may result in graft loss. Removal of too much of the buccal fat pad may induce facial disfigurement or mouth opening limitation. Buccal pad of fat was used in 3 cases which are used to cover small defects with no complications.

Forehead flap can be used as hemi forehead flap or total forehead flap. The superficial temporal artery is considered the dominant pedicle of the flap. The motor innervation of the flap is through the frontal branch of cranial nerve VII (of the facial nerve). Brow elevation function is completely lost with the use of the standard forehead flap. The sensory nerves supplying the flap arise from supratrochlear, supraorbital, and auriculotemporal nerves [14-16]. Forehead flap is hairless and firmly holds the suture very well. Blood supply is excellent due to presence of a longitudinally and horizontally oriented vasculature which permits rotation on the radius of either the superficial, temporal or supra orbital artery. However it produces noticeable donor defect, requires second surgery, flap necrosis can also occur. We encountered trismus in 2 cases in which we utilised forehead flap.

Split thickness skin grafts & full thickness skin grafts were associated with high incidence of trismus i.e. about 100 % which can be attributed to the

extensive disease and inability of the patients to vigorously perform physiotherapy, so we avoid using grafts in buccal defects.

We included cosmesis, difficulty in swallowing, trismus and psychological and emotional factor to evaluate the functional outcome. 12 cases had well, 11 cases had satisfactory, 16 cases had fair & 7 cases had poor functional outcome.

The high incidence of functional difficulty face by patient is correlated by various authors. Poor socioeconomic status and far flung areas are the reason that most of patients are unable to attend regular physiotherapy clinics, resulting in an increasing incidence of trismus and swallowing difficulty.

Functional outcome is an important supplement to information pertaining to treatment outcome for head-and-neck cancer patients. Functional outcome includes the perception of the effects of disease and the impact on the patient's daily functioning, especially physical, psychological, social and emotional functional domains. However it is subjective and self-reporting according to the patient's own experiences. With the use of functional outcome, the manner in which patients perceive and cope with their disease could be usefully assessed.

We found that oral cancer survivors with older age, lower annual family income, and more advanced cancer stage and flap reconstruction had significantly worse functional outcome. Socio-economic status is a well-known predictor of disease morbidity or mortality rates. Individuals lower in the socio-economic hierarchy suffer disproportionately more from almost every disease and have poorer prognosis than those with higher socio-economic status.

CONCLUSION

Microvascular surgery has revolutionized the reconstruction after ablative head and neck cancer surgeries, but locoregional flaps & grafts knowledge makes head and neck surgeon capable of delivering good patient service in setup with minimal resources and expertise.

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