

Onco Reconstruction of Hemifacial Defects – Post Oncological Excision of Advanced Oral CancerShailendra B Singh¹, Deepanjali Kalra², Rahul Kaushik³, Manisha Singh⁴¹ Assistant Professor , Department of Burns and Plastic Surgery , Smt N.H.L Municipal Medical College and Consultant Plastic Surgeon Zydus Hospital, Ahmedabad, Gujarat.² Resident Doctor, Department of Burns and Plastic Surgery, Smt NHL Municipal Medical College and S.V.P Hospital, Ahmedabad, India³Resident Doctor, Department of Burns and Plastic Surgery, Smt NHL Municipal Medical College and S.V.P Hospital, Ahmedabad, India⁴Resident Doctor, Department of Burns and Plastic Surgery, Smt NHL Municipal Medical College and S.V.P Hospital, Ahmedabad, India

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Corresponding Author: Dr Shailendra B Singh

Conflict of interest: Nil

Abstract**Aim:** To study various ways of reconstructing hemifacial defects following supramajor Onco surgery in advanced oral cancer cases.**Introduction:** Head and neck cancer is the sixth most common type of cancer. It is a big challenge for oncoplastic surgeons to reconstruct these huge defects, as wide local excision of these tumors creates significant defects in functionally critical tissue. Reconstructive surgery requires close attention to both form and function.**Patient and Methods:** In our retrospective case series of 12 patients, we performed supramajor surgery for the reconstruction of hemifacial defects on 12 patients by our chief surgeon, out of which 10 were male (83.4%) and 2 patients were female (16.6%). Almost all of them were advanced malignancies and T4 tumors with N0 to N2 nodes and no distant metastasis. TNM cancer staging was all of stage IV, an advanced stage of tumor with histopathological diagnosis of either well differentiated, moderately differentiated, or poorly differentiated squamous cell carcinoma.

After oncological resection, hemifacial defects were created, which were covered using a combination of two or more flaps, one microvascular and one pedicled flap, or two pedicled flaps or two free flaps. Pedicled flaps such as DP, PMMC, forehead, nasolabial, etc. were used in various combinations with microvascular-free flaps like Fibula, RAFF, ALT, LD, etc.

Results: In our retrospective case series of 12 patients presenting with T4-staged head and neck cancer, they underwent resection, resulting in hemifacial defects. Four cases were reconstructed using a bilateral PMMC flap, and in three cases, a bipaddle ALT flap. In three cases, hemifacial defects were reconstructed using a PMMC flap in combination with a forehead or DP flap; one case was reconstructed using bilateral RAFF; and one case was reconstructed using contralateral PMMC with an ALT flap. All the flaps healed well, with functionally and aesthetically acceptable results and no further complications. The patient underwent radiotherapy or chemotherapy postoperatively.**Conclusion:** Post-palliative oncological resections lead to huge hemifacial defects. It is a complex task for the oncorconstructive surgeon. Using a combination of free flaps, pedicled flaps, or regional flaps, defects as huge as hemifacial defects are reconstructed. Hemifacial defect reconstruction requires supra-major oncoconstruction, keeping in mind functional and aesthetically acceptable results.**Key words:** Hemifacial defects, Oncoreconstruction, Palliative oncosurgeryThis is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

India has a large number of head and neck cancer cases because of the widespread usage of tobacco products in various forms, like gutka, pan masala, areca nuts, etc. Increased health care facilities also lead to increased diagnosis and surgical treatment of head and neck cancers, which usually involve the excision of huge amounts of malignant tissues in the

region of the head and neck. Head-neck cancer is the sixth most common type of cancer, with an estimated 350,000 deaths worldwide each year [1].

It is a big challenge for oncoplastic surgeons to reconstruct hemifacial defects, as wide local excision of these tumors creates a significant and huge defect

in functionally critical tissue. **Hemi-facial** defects mean the defects covering the cheek, buccal mucosa, alveolus, and might extend to the neck.

Reconstructive surgery requires close attention to both form and function. Maintaining the integrity of the alimentary and respiratory tracts, reconstructing facial tissue for expression, and covering major structures in the neck are important aspects of reconstruction. Therefore, reconstruction following resection is crucial for the physical and psychological well-being of the patient.

There are various methods for reconstruction of these tissue defects in the form of local, regional, and distant flaps. Various local and microvascular free flaps are used to cover facial defects formed after oncological resection of tumors. Like Pectoralis major myocutaneous flap, anterolateral thigh flap, free fibular flap, etc.

In this case series of 12 patients, we are discussing various methods used to cover hemi-facial defects after oncological resection of tumors.

Materials and Methods

In our retrospective case series of 12 patients, we performed supramajor surgery for the reconstruction of hemifacial defects on 12 patients, out of which 10 were male (83.4%) and 2 patients were female (16.6%). Almost all of them were advanced malignancies and T4 tumors with N0 to N2 nodes and no distant metastasis. TNM cancer staging was all of stage IV, an advanced stage of tumor with histopathological diagnosis of either well differentiated, moderately differentiated, or poorly differentiated squamous cell carcinoma.

After oncological resection, hemifacial defects were created, which were covered using a combination of two or more flaps, one microvascular and one pedicled flap, or two pedicled flaps or two free flaps. Pedicled flaps such as DP, PMMC, forehead, nasolabial, etc. were done in various combinations. [2,3] with microvascular-free flaps like fibula, RAFF, ALT, LD, etc. [4,5,6].

Table 1: Gender Bias

Male	10	83.4%
Female	2	16.6%
Total	12	100%

Table 2: Age distribution

AGE	NO. OF PATIENTS	PERCENTAGE
< 20	nil	0%
30-40	2	16.6%
40 -50	5	41.6%
50-60	3	25%
>60	2	16.6%

Table 3: T4 staged tumour with Hemifacial defects and Supramajor Oncoreconstruction

NO.	DIAGNOSIS	DEFECT	RECONSTRUCTION
1	Fungated Growth left Cheek	Commando with hemifacial defect left. cheek extending to neck	Bilateral PMMC
2	Fungating recurrence Tongue, alveolus and Cheek	Hemifacial Defect	Bilateral PMMC
3	Fungated lesion right cheek	Commando with defect Right Cheek	Bi paddle ALT
4	Squamous cell on on Right side buccal mucosa and Precancerous lesion on left side of RMT	Commando on both Right and left Buccal mucosa	Bilateral RAFF
5	Squamous cell Ca Cheek with Fungation outside left cheek	Hemi facial Defect over Buccal Mucosa and left cheek .	Bilateral PMMC
6	Recurrence Right Tongue Left Commando with PMMC done 5 years back	Commando with Hemi facial defect	Forehead + PMMC
7	Carcinoma Left Cheek with fungation	Commando with left Hemi facial Defect	Contralateral PMMC with ALT
8	Carcinoma Left Cheek with fungation	Commando with left Hemifacial defect	PMMC + Single stage DP
9	Carcinoma Left Cheek with Fungation.	Commando with left Hemi facial defect	Bipaddle ALT
10	Carcinoma right Cheek with fungation	Commando with Right Hemi facial defect	PMMC + DP
11	Carcinoma Right Maxilla and right orbit	Right Maxillectomy with Righ Orbit exentration	Bipaddle ALT flap
12	Recurrence Carcinoma Hard Palate with buccal mucosa	Excision of Hard palate with loss of Buccal mucosa with Cheek defect	BilateralPMMC flap



Reconstructive Stage :
R3P2M1

Figure 1: Hemifacial defect post carcinoma cheek reconstructed using ALT flap .



Figure 2: Post carcinoma cheek resection reconstruction by ALT flap



Figure 3: Hemifacial defect post resection of carcinoma left cheek reconstructed using bilateral pectoralis major myocutaneous flap



Figure 4: Carcinoma left cheek reconstructed using left PMMC and DP flap .

Results :

In our retrospective case series of 12 patients presenting with T4 staged head and neck cancer who underwent resection resulting in hemifacial defects, 4 cases were reconstructed using bilateral PMMC flaps, 3 cases used bilateral ALT flaps for defect coverage, 3 cases of hemifacial defects were reconstructed using PMMC flaps in combination with forehead/DP flaps, one case was reconstructed using bilateral RAFF, and one case was reconstructed using contralateral PMMC with ALT flap. All the flaps healed well, with functionally and aesthetically acceptable results and no further complications. The patient underwent radiotherapy or chemotherapy postoperatively.

Discussion:

Reconstruction of the head and neck involves the restoration of integrity, function, and, lastly, aesthetics. In head and neck defects, postoncological resection free tissue transfer is the first choice for the reconstruction of large or composite defects involving bone, skin, or soft tissue, as it brings its own blood supply, is resistant to radiation, and decreases the cost and morbidity by providing an optimal reconstruction.

Head and neck reconstruction has evolved over the years. The necessity for immediate reconstruction of the head and neck was described by Edgerton in 1951 [7]. After that, the deltopectoral flap by Bakamjian in 1965 [8] and the pectoralis major flap by Ariyan in 1979 [9] were the milestones in head and neck reconstruction. These regional flaps provided a single-stage reconstruction with less morbidity. Later, free tissue transfer like free jejunal flaps [10] and fasciocutaneous flaps [11, 12] were described. A free radial forearm flap was described by Yang et al. [13]. Introduction of the deep circumflex iliac artery flap by Taylor et al. [14] for reconstructing bony defects

In early 2000, for central arch reconstruction with vascularized fibula, we used PMMC and DP flaps for inner and outer coverage. With the osteocutaneous segment, we can now cover both inner and outer defects with a big skin paddle. Defects of the maxilla and hard palate with or without eyeball exenteration also pose big problems for reconstruction. We have used LD, ALT, or PMMC for coverage. In the case of orbital exenteration, the flap of choice for this purpose is ALT.

Palliative oncosurgery results in huge hemifacial defects in the head and neck regions. But with the help of both pedicled flaps and free flaps, and with different combinations and following the algorithm, we can cover the major defect in one single-stage reconstruction, which reduces the infection and early recovery with less postoperative morbidity. It helps

with early and timely radiation and rehabilitation. [15]

While performing a supramajor reconstruction, we look into the aesthetic and functional parts to achieve a normal-looking and functional lip, cheek, tongue, mandible maxilla, etc. We try to get a functionally acceptable, near-normal look with speech, deglutition, etc. Thus, postoperative rehabilitation [16] is also an important part of palliative oncoconstruction.

Conclusion

With the advancement in medical facilities and better instruments, oncosurgeons now operate on advanced head and neck cancer patients. Post-oncological resection results in huge hemifacial defects. Coverage of huge defects is a complex task for the oncoconstructive surgeon. Free flaps, pedicled flaps, regional flaps, or their combinations are used to cover hemifacial defects. Hemifacial defect reconstruction requires supra-major oncoconstruction, keeping in mind functional and aesthetically acceptable results.

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