



RECONSTRUCTION OF TWO DISCRETE SURGICAL DEFECTS IN HEAD AND NECK IN THE ABSENCE OF FREE FLAP AVAILABILITY-AN INSTITUTIONAL EXPERIENCE

Oncology

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ABSTRACT

Introduction: Operable oral and oropharyngeal tumors with extra nodal extension infiltrating the skin at level II to V require resection of primary and extended radical neck dissection can result in a defect at both primary and neck with intervening normal tissue. Ideally they need to be reconstructed with a chimeric free flap but in cases where it was not possible, locoregional flaps were utilized.

Aim- To discuss and compare our experience with various methods to reconstruct two discrete defects.

Materials And Methods: This is a retrospective study from the Head Neck Oncology Dept of a Kidwai Memorial Institute Of Oncology, Bangalore, India between March 2016 – August 2021. A total of 14 were included in this study and divided into 3 groups. Group-1 included Pectoralis Major Myocutaneous Flap (PMMC) in a dual island technique, group-2 included reconstruction with combination of two locoregional flaps. Group-3 included reconstruction with PMMC with split skin graft(SSG) covering for external defect.

Results: The time taken to raise a dual-island PMMC and for PMMC with split thickness skin grafting an average is 50minutes compared to group-2- 90minutes. The time for insertion into the defects were one-and-a-half times more in the group-2 than other groups. No patients in group 1 and group 2 had a delay in receiving adjuvant treatment, whereas 50% of patient in group-3 could not receive adjuvant radiotherapy on time due to delayed wound healing.

Conclusion- any of the three options can be considered for reconstruction of two discrete defects. PMMC with dual island technique found to be the most effective one with shorter operating time and with the least complication rate.

KEYWORDS

dual island PMMC ,combination of two locoregional flaps,PMMC with skin graft

INTRODUCTION:

Reconstruction of post-surgical defects in head and neck malignancies are challenging. With the introduction of free flaps complex composite reconstructions are possible with a good functional and aesthetic outcome. Where free flaps reconstruction is contraindicated or not feasible due to lack of a reconstructive team, loco-regional flaps remain the choice. Tricky situation arises when resection of primary with metastatic cervical nodes with neck skin involvement (especially at level II to V) leaves two defects, one at the primary and the other at neck with intervening normal tissues. Continuous defects can be managed with a single bipaddle flap but when the defects are separated by intervening normal tissue especially in oral and oropharyngeal tumors, the defects need to be addressed with multiple flaps. We have used different techniques to address the non-adjacent defects, which were compared here.

MATERIAL AND METHODS

This is a retrospective study from the Head Neck Oncology Dept of a Kidwai Memorial Institute of oncology, Bangalore, India between March 2016 – August 2021.

Inclusion Criteria:

1. Patients with two surgical defects, one at the primary site and the other at neck, with intervening normal tissue were included. Patients with proven squamous cell carcinoma at oral cavity or

oropharynx with clinico-radiologic evidence of cervical nodal metastasis with extranodal extension with skin infiltration were included in the study.

Exclusion Criteria:

1. Patients with continuous neck and primary surgical defects were excluded.
2. Patients operated with Free flaps were not considered.

The patient and family were counseled about the complex surgery, reconstructive procedures, speech and swallowing dysfunction, delayed wound healing, and prolonged hospital stay.

The data of 14 patients were retrieved from the files, 12 were oral cavity, one oropharynx and one larynx. Details regarding the time taken to raise the flap and reconstruct the defects, need for blood transfusion, number of days of ICU stay, flap related complications, time to decannulation and time to start oral feeds were collected.

Patients were divided into 3 groups based on flap design, technique and number of flaps/ skin grafting.

Group 1: includes dual-island PMMC technique (described in detail by Siddappa et al⁸.)

Group 2: the combination of two locoregional flaps, one for primary

defect and other for neck defect were used.

Group 3: PMMC with split thickness skin grafting was considered.

RESULTS

Details of patients' demographics, diagnosis and size of defect are given in (table-1).

- Group 1: 6 patients with oral cancer were included, M:F 2:1, in the age range of 43 to 62 years (mean 54 years) who had their primaries located in the buccal mucosa in 4/6 and in the tongue 2/6 patients.
- Group 2: 4 patients were included in this group. All were male with the age range 46-68 yrs (57 yrs), primaries were in oral cavity (n=3) and (n=1) larynx.
- Group 3: 4 patients were under this group with an equal gender ratio with age range 44-60 yrs (54 yrs). Details are included in table-2

Table 1 Showing Demographic Data, Patient Details And Surgical Defect.

	Dual-island technique Group-1	Combination of two locoregional flaps Group-2	PMMC with split thickness skin grafting Group-3
No. of patients	6	4	4
M:F	2:1	4:0	1:1
Mean Age	54	57	54
Location of primary	Buccal Mucosa=4, tongue=2	Buccal mucosa=2, tongue=1, larynx=1	Buccal mucosa=2, Tongue=1, Tonsil=1
Average defect size in primary	6*5cm	6*6cm	6*10cm
Average defect size in neck	6*6cm	6*6cm	8*6cm

Table-2: Different Methods Used To Close Primary And Neck Defect In Group 2 And 3

Primary defect	Flap for Primary defect	Flap for neck group-2	Neck defect cover Group-3
Tongue	PMMC	Deltopectoral flap n=1	STSG n=1
BM	PMMC	Deltopectoral flap n=1 Supraclavicular flap n=1	STSG n=2
Tonsil	PMMC	-	STSG n=1
Larynx	PMMC	Deltopectoral flap n=1	

All the three groups were well matched in terms of age although the comparison group 2 had no female patients. The primary sites were well matched, with the exception of larynx, which was unique to the comparison group 2.

The time taken to raise a dual-island PMMC (group1) and for PMMC with split thickness skin grafting (group 3) were 50% less than the time taken to raise two separate locoregional flaps (group 2). Also the time taken for insertion in group 2 was 1.5 times more than group 1 and 3 (table-3).

Table-3: Comparison Of Operative Time Of Harvesting , Inset And Donor Site

	Group-1 Dual-island technique- n=6	Group-2 two flaps n=4	Group-3 PMMC with STSG n=4
Time taken for raising flap	40-50mins (45)	80-100mins (90)	40-50mins (45)
Time taken to inset flap	45-65mins(50)	90-100mins (95)	45-65mins (45)Ω
Donor site closure	Primary closure	SSG- 3 cases	Primary closure-3 STSG -1

All the donor sites could be closed primarily in the dual-island PMMC group in spite of the large skin defects, whereas in group 2 skin

grafting was used. All the donor sites healed well, with exception of one case in group 2.

The complications in both the groups were minor (table-4). One dual-island PMMC underwent venous congestion which was promptly addressed by releasing a few sutures before any flap morbidity could occur. The deltopectoral flap of a patient in group 2 underwent partial tip necrosis. In group 3, minor complications like skin graft loss, infection and wound dehiscence were noted in three cases, thereby delaying adjuvant radiation therapy.

Table 4: Compares The Complications Of The Dual-island PMMC With The Combination Of Two Locoregional Flaps And Grafting.

Complications	Group-1	Group-2	Group-3
Venous congestion	1	0	0
Partial flap necrosis	0	Deltopectoral flap -1	1
Wound dehiscence	1	0	delayed wound healing in 3 cases
Wound infection	0	0	1 case
Wound healing	12-25 days	14-25 days	28-50 days
Donor site morbidity	0	SSG partial loss	0

None of the above group patients needed prolonged tracheostomy / had difficult decannulation or difficulty in re-starting oral feeds.

DISCUSSION:

In Southeast Asia oral cancers are frequent due to rampant use of chewable tobacco. Most of the patients present to the clinician at an advanced stage due to lack of awareness. Treating such patients requires a multidisciplinary team. Most reconstructions are done by the Head and Neck surgeon or by the Maxillofacial surgeon who are trained in locoregional flaps. Complex head and neck defects however require vascularized free flaps. Noncontiguous defects usually require a combination of two flaps either both free flaps^{1,2,3} or combination of local and free flaps^{4,5}. Free flap reconstruction though ideal may not sometimes be feasible due to patient factors like old age and comorbidities where shorter operating times are preferred. Hospital related factors like non availability of a reconstructive team may also be contributory. In such situations a combination of locoregional flaps^{6,7} can be utilized. We have tried different techniques like PMMC flap with two skin islands^{8,9} or PMMC with skin grafting¹⁰ or PMMC in combination with other locoregional flaps in our institute, which were compared and discussed here.

In our institute we do an average 140 (120-160) cases head and neck reconstruction annually. Indication for reconstruction of two different sites with normal intervening tissue is rare. We have encountered 14 cases in the past five years with different methods of reconstruction.

Here, 3 different techniques which were used in our institute over the past 5 years in lieu of free flaps for two discrete head and neck defects were compared.

We found that the time taken for harvesting the double island flap [group-1] is the same as PMMC with SSG [group-3] and is equal to half the time required for harvesting the combination of two locoregional flaps [group-2]. The time taken for flap inset is slightly more in the group 2.

With regards to complications, no major complications like complete flap loss was noted in any groups. Only one patient in group 2 had a partial flap loss, which required debridement and secondary suturing. In the double island technique, we encountered one case with venous congestion which was managed promptly by release of a few sutures. 75% of cases in group-3 had delayed wound healing/infection.

Donor site closure was done primarily in all the 6 cases in dual island technique whereas split thickness skin grafting needed to cover the donor site in 3 out of 4 cases [75%] of combination flaps. When we use SSG grafting at the chest wall it does not delay the adjuvant radiation as it is not included in the radiation field, but when we use it to cover the PMMC flap in the neck as in group 3 it took a longer time to heal and delayed the adjuvant radiation. Therefore it is not a good option when adjuvant radiation is contemplated. In our study 2/4 [50%] cases in this technique are salvage cases which didn't require adjuvant therapy.

Wound healing in group 1 and group 2 is similar which is around 12-25

days but it takes longer time [around 28-50days] in group 3 i.e.PMMC with SSG. There was no difference in the time for decannulation and oral feeding with respect to technique chosen.

CONCLUSION:

Reduced operating times, negligible complication rate with near normal wound healing time makes the dual-island PMMC a better choice in selected patients when compared to other techniques in the reconstruction of large dual discrete head-neck defects, where free flaps cannot be used.

Conflict Of Interest: None

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