



FREE FLAP VS PEDICLED FLAP RECONSTRUCTION IN HEAD NECK ONCOSURGERY : AN INSTITUTIONAL EXPERIENCE FROM A SINGLE SURGICAL TEAM

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ABSTRACT

In Indian population Head and neck cancers are one of the leading causes of morbidity and mortality. Reconstruction and restoration of function are also of paramount importance in these patients. The aim of this study was to report outcomes for free flaps and pedicle flaps in patients with oral cavity cancers. A retrospective analysis of 314 patients with oral cavity cancers who underwent reconstruction with either free flaps or pedicle flaps during 2020–2025 was done. The median age of the cohort was 49 years. The free flap reconstruction was performed in 239 (76%) and pedicle flap in 75 (24%) patients. Among free and pedicle flaps, 13 (5.6%) and 2 (2.6%) respectively had major flap complications and 12 (5.1%) and 7 (9.3%) respectively had minor complications. CCI score > 4 was associated with higher events ($p = 0.02$) in free flap group. The outcomes of free flaps are similar in comparison to pedicle flaps in patients with oral cavity cancers. The higher CCI score is significantly associated with increased flap-related complications for the free flap group.

KEYWORDS

free flap; pedicle flap; head neck reconstruction

INTRODUCTION

In Indian population, Head and neck cancers are one of the leading causes of morbidity and mortality. Overall, 57.5% of global head and neck cancers (excluding esophageal cancers) occur in Asia especially in India [1]. Head and neck cancers in India account for 30% of all cancers [2].

Reconstruction and restoration of function are of paramount importance in the approach of head and neck cancer management. Maintaining the integrity of the upper aero-digestive tract and preserving the vital functions such as speech, mastication, and deglutition are the mainstay of reconstructive management.

Free flaps have proved to be superior to the pedicle flaps in terms of versatility, superior esthetic, and functional outcomes [3, 4]. However, they are often criticized for being associated with prolonged operating time and higher cost. In Indian scenario, because of the cost constraints, lack of specialized infrastructure, and relatively easy learning curve, pedicle flaps like pectoralis major myocutaneous flap are still being used widely for head and neck reconstructions. As no concrete comparative data is available in Indian scenario regarding the outcome between the free and pedicle flaps in head and neck cancers, this study concentrates upon the same.

MATERIALS AND METHODS

A retrospective analysis of prospectively maintained database of 532 patients with oral cavity cancers operated by the same team of onco-surgeon and plastic and reconstructive surgeons was done. The time frame of the study was from January 2020 to July 2025. 218 patients had primary closure and were excluded from the study. They were excluded from the study. So, total of 314 patients were included in the study.

Preoperative clinico-radiological evaluation was done for all patients. All underwent resection of the primary tumor, neck dissection, and appropriate reconstruction of oncosurgical defects. Patients who underwent pedicle flap reconstruction or micro-vascular reconstruction (free flaps) were included for the analysis. Patients with primary closure and local flaps were excluded from the analysis. The type of reconstruction for defects was divided as follows:

- For posterior segmental mandibulectomy defects (condyle sacrificed) or buccal mucosa composite resections, reconstruction was done using either a pectoralis major myocutaneous (PMMC) flap or free anterolateral thigh (FALT) flap.
- For middle third segmental mandibulectomy defects/ segmental mandibulectomy defects (where condyle was preserved), free fibula flap (FFOCF) was used for reconstruction.
- For maxillary tumors or upper gingivobuccal sulcus tumors, reconstruction was done using ALT flap or PMMC flap.

In order to minimize selection bias and make the interventions more evenly comparable with respect to bony defects, it was decided to additionally compare PMMC with FALT since both flaps were used for similar indications. Complications, re-exploration, and flap-related mortality data were noted with the respective event dates. Complications were classified using the widely accepted Clavien–Dindo classification system [5]. Comorbidity variables of all patients were stratified using the Charlson Comorbidity Index (CCI) [6]. All patients were closely followed up peri-operatively for the 1st month and every 3 months thereafter for 2 years.

Prognostic variables were analyzed using the log rank test for univariate analysis and Cox proportional hazard for multivariate analysis. p values < 0.05 were considered statistically significant. Graphical assessment of data and all calculations were performed using SPSS 30 software.

RESULTS :

Out of the 314 patients included in the study, average age in free flap group vs pedicle flap group was 46 years and 48 years respectively. Moreover, out of 314 patients, 239 underwent free flap reconstruction while 75 patients underwent pedicle flap reconstruction. Males clearly dominated the frequency in both the groups (86.1% vs 82.7% respectively).

In both the groups the T3/T4 staging were the bulk majorities comprising of 84.9% and 85.3 % respectively. However, node positivity was on the lower side compared to node negativity. Buccal Mucosa (BM) and Gingivo Buccal (GB) sulcus was the most common primary site in both the groups followed by Tongue and floor of mouth (FOM). Among free and pedicle flaps, 13 (5.6%) and 2 (2.6%) respectively had major flap complications and 12 (5.1%) and 7 (9.3%) respectively had minor complications. CCI score > 4 was associated with higher events ($p = 0.02$) in free flap group. The outcomes of free flaps are similar in comparison to pedicle flaps in patients with oral cavity cancers. The higher CCI score is significantly associated with increased flap-related complications for the free flap group.

Table 1 : Comparison between the 2 groups

	FREE FLAP	PEDICLE FLAP
AGE		
Mean	46 yrs	48 yrs
Range	20-82 years	26-80 years
GENDER		
Male	206	62
Female	33	13
“T” Stage		
T1	12	4
T2	21	7
CONCLUSIONS T3	53	24

T4	153	40
“N” Stage		
Positive	80	34
Negative	159	41
STAGING		
I/II	33	11
III/IV	206	64
CCI SCORE		
>4	13	2
<4	12	7
SITE		
BM/GB Sulcus	182	56
Tongue/FOM	45	15
Maxilla	7	2
Lip	5	2

The success of a reconstruction necessitates proper preoperative planning and evaluation of the patients and choice of reconstructive technique should be devised according to their co-morbidities, site of lesion, and other various factors. Both free and pedicled flaps can provide great aesthetic and functional outcome with proper planning and technical expertise, hence improving the quality of life.

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